

## BOOK 2

### FINISHING MACHINE

American Model L

Landis, 100 Line, Model 102

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## PART ONE

### INTRODUCTION

---

#### Section I. GENERAL

##### 74. Scope

The instructions in book 2 apply to the Finishing Machine, American Model L and Landis, 100 Line, Model 102. The finishing machine contains the buffing, sanding, and trimming wheels which dress the shoe in the final stage of the shoe repair operation.

*a.* Part two contains information on the operation of the finishing machine with a description of its controls and instruments.

*b.* Part three contains information for the guidance of personnel of using organizations responsible for the first and second echelon maintenance of the finishing machine. It contains information needed for the performance of the scheduled lubrication and preventive maintenance services. Paragraphs 110 through 125 are devoted to second echelon maintenance and adjustment of the various assemblies and major units comprising the Landis, 100 Line, Model 102 and the American Model L Finishing Machines. These sections contain short descriptions of components of the systems in the machine and explanations of their functioning and interrelationship. Only the maintenance which the unit mechanic of the using organization is authorized to perform is included in these sections. The components of the finishing machine are relatively simple in construction and operation, and the unit mechanic of the using organization may repair any assembly of the finishing machine except the motor.

##### 75. Records

*a.* WD AGO FORM 460 (PREVENTIVE MAINTENANCE ROSTER). The parts of this form which apply to stitching machines may be maintained to record the lubrication of this equipment as described in paragraphs 102 and 103.

*b.* WD AGO FORM 468 (UNSATISFACTORY EQUIPMENT REPORT). This form will be used to

report defects in the manufacturing, design, or operation of machines, assemblies, or parts. The same form will be used to report complaints on the lubricants and preserving materials used in the machines. When so used, the form will contain identifying details of the products and the machinery on which they are used.

##### 76. Orientation

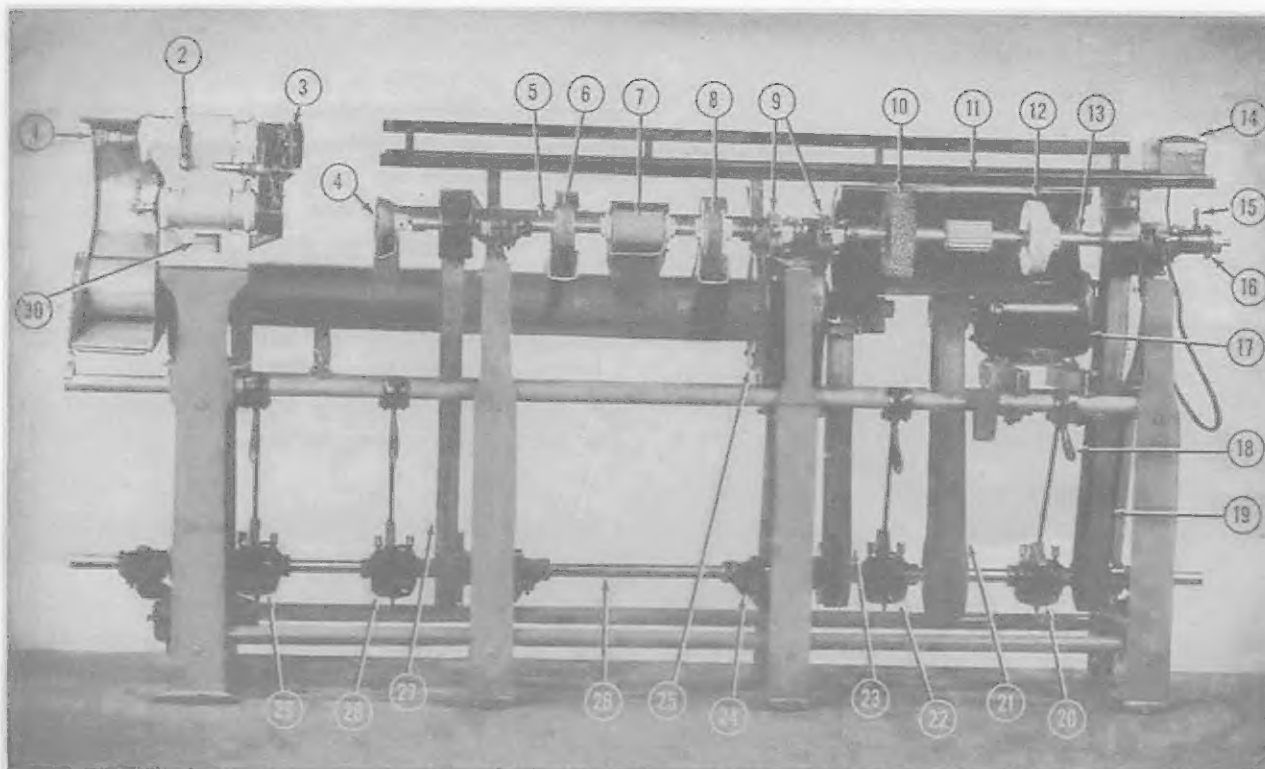
Throughout this book, the terms FRONT, REAR, LEFT, and RIGHT are used as the operator would use them when standing at the controls of the machine in the operating position.

#### Section II. DESCRIPTION AND DATA

##### 77. Description

*a.* GENERAL. In the finishing machine (fig. 129), the power shaft runs through the length of the base of the machine. The upper shaft carries the operating wheels. The edge trimmer, stitch picker, and cutter grinder are mounted as a unit in the end of the machine frame but are driven by the power shaft. In the Landis portable shoe repair unit Model 12 K-100 Special (fig. 131), the finishing machine is mounted on a common frame with the stitcher unit. These machines are powered by a 1½-horsepower electric motor.

*b.* IDENTIFICATION INFORMATION. The operator should be able to identify the manufacturer, model, and serial number of his machine. This information is especially important in the requisitioning of replacement parts. On the American Model L (fig. 130) and the Landis, 100 Line, Model 102 (fig. 129) the name of the manufacturer appears on all of the four front frame legs. On both machines an identification plate appears at the top of the front leg beneath the edge trimmer. The finisher in the Landis portable shoe repair unit Model 12 K-100 Special (fig. 131) will be designated by that model and number.



Ref. No.	Nomenclature	Ref. No.	Nomenclature
1	Edge trimmer.	16	Edge setter.
2	Brake lever.	17	Motor.
3	Cutter grinder.	18	Clutch control handle.
4	Heel breaster.	19	Burnisher shaft drive belt.
5	Sander shaft.	20	Burnisher shaft clutch.
6	Heel sander.	21	Power shaft drive belt.
7	Bottom sander.	22	Blower clutch.
8	Heel sander.	23	Blower drive belt.
9	Sander and burnisher shaft bearings.	24	Power shaft bearing.
10	Finishing brush.	25	Blower.
11	Shelf.	26	Power shaft.
12	Burnishing wheel.	27	Sander shaft drive belt.
13	Burnisher shaft.	28	Sander shaft clutch.
14	Power switch.	29	Edge trimmer clutch.
15	Edge setter heat control handle.	30	Edge trimmer drive belt.

Figure 129. Landis, 100 Lille, model 102 finishing machine.

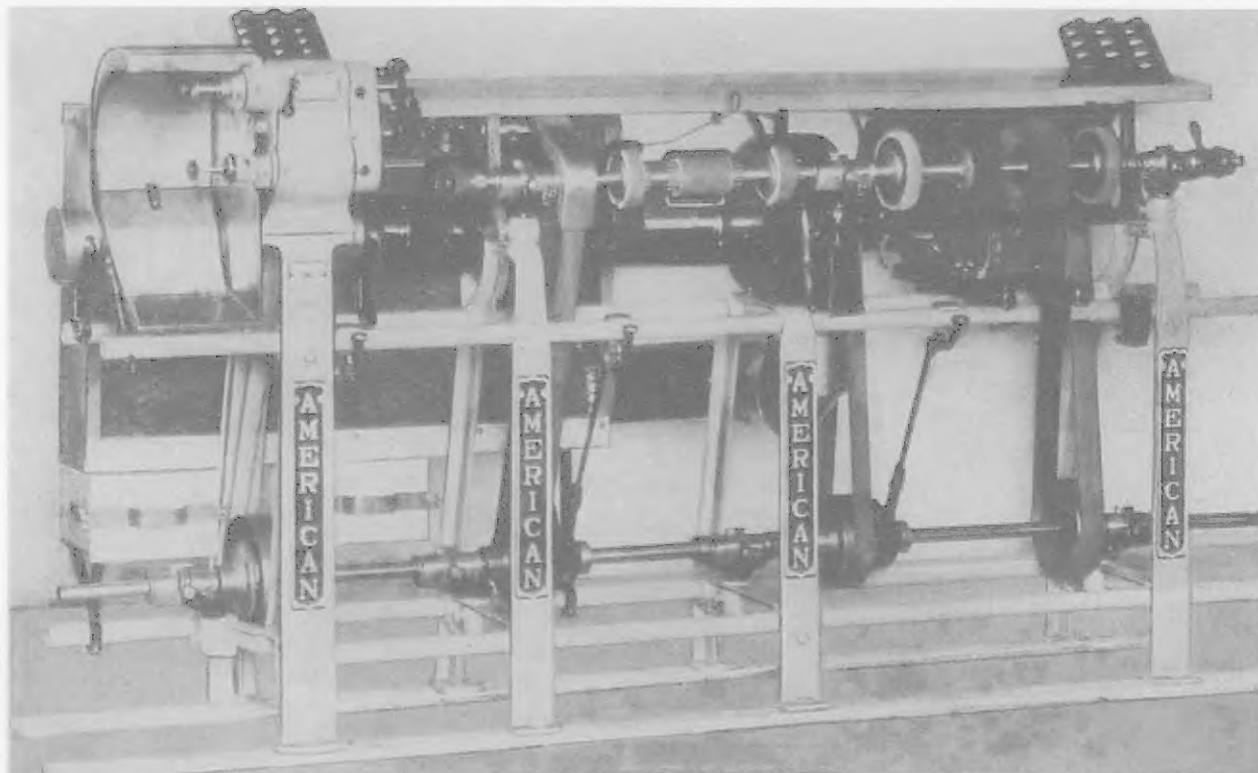


Figure 130. American model L finishing 111, acf-line.

c. DIFFERENCES IN MODELS. For operational purpose, the American Model L finisher and the Landis. 100 Line, Model 102 finisher may be considered alike. For maintenance purposes, the two models differ only in clutch design. ( See par. 110.) Minor differences in the structural detail of these models are apparent in figures 129 and 130.

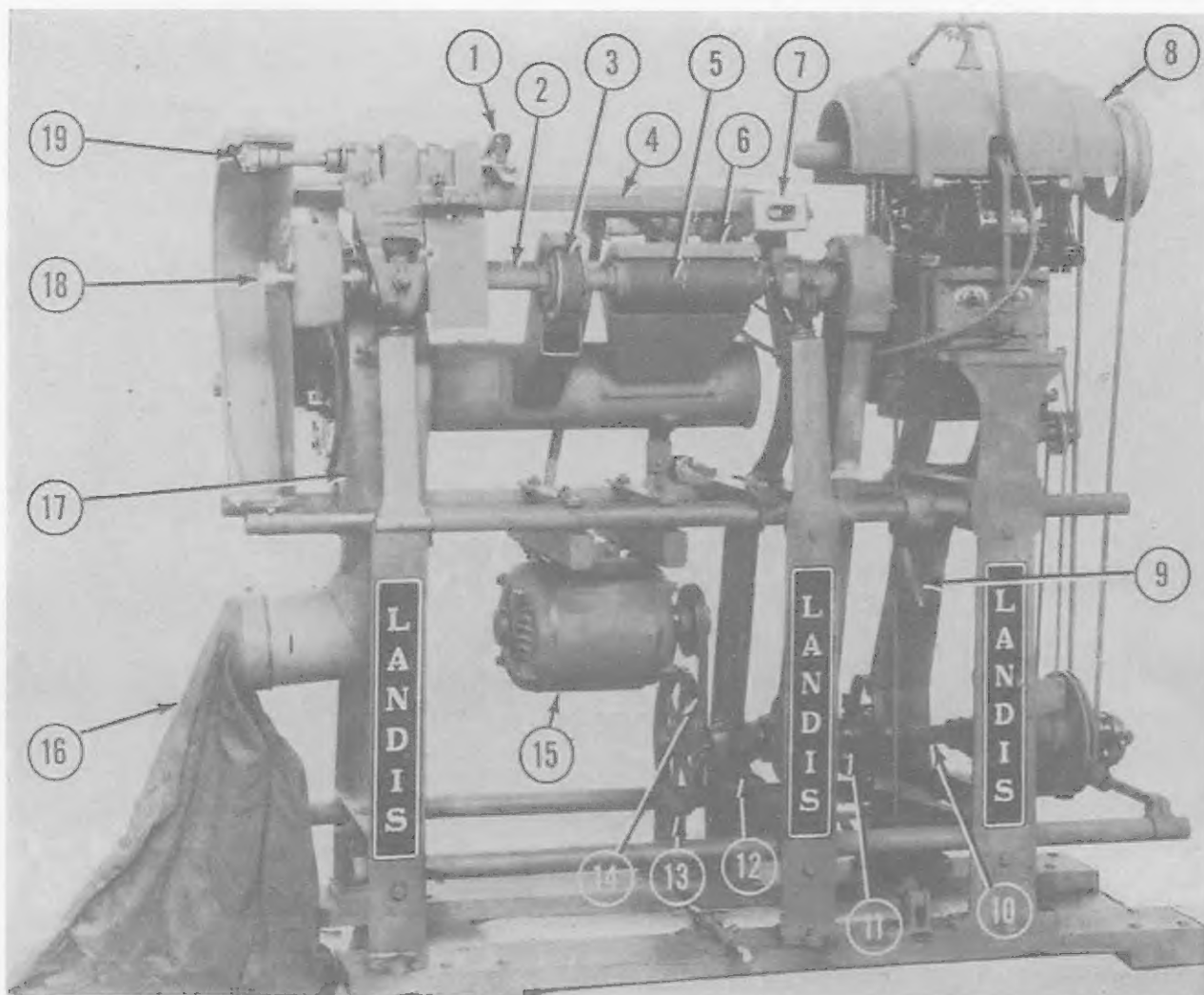
#### 78. Tabulated Data

a. FINISHER SPECIFICATIONS, LANDIS, MODEL, PACKAGED.

Dimensions (in.)			Weight (lb.)		
Length	Width	Height	Gross	Net	Dust collector
105	25	60	1,340	775	42

#### b. MOTOR SPECIFICATIONS.

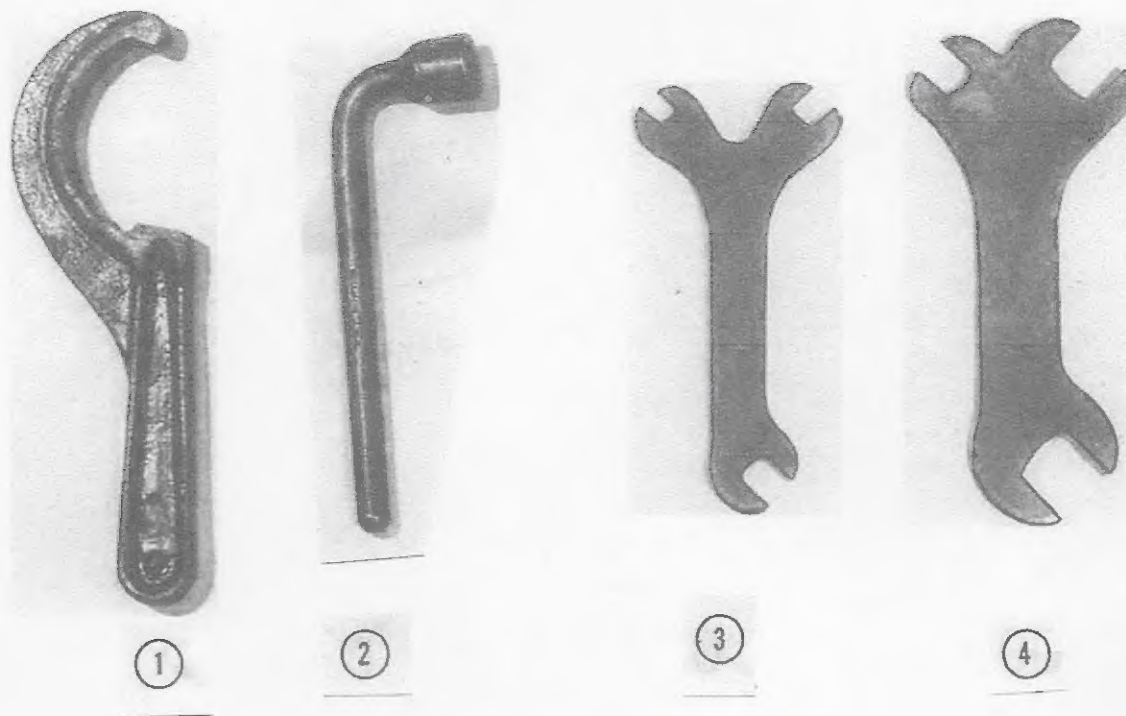
Horsepower.....	1.5
Phase.....	Single
Cycles.....	60
Volts.....	110-220
Revolutions per minute.....	1,750



Ref. No.	Nomenclature	Ref. No.	Nomenclature
1	Cutter grinder.	11	Clutch.
2	Finishing shaft.	12	Power shaft bearing.
3	Heel sander.	13	Drive pulley.
4	Shelf.	14	Power drive belt.
5	Bottom sander.	15	Motor.
6	Bottom sander hood.	16	Dust collector.
7	Power switch.	17	Blower.
8	Landis 12 K sole-titching unit.	18	Edge setter.
9	Clutch control handle.	19	Edge trimmer.
10	Power shaft.		

Figure 131. Landis portable shoe repair unit, Model 12 K-100 Special.





Ref. No.	Vendor's part No.	Vendor's name
1	26-SH	Spanner wrench.
2	60-4-90SC	Socket wrench.
3	60-8-601	Triple head wrench.
4	60-8-602	Triple head wrench.

Figure 132. Tools.

### Section III. TOOLS AND ACCESSORIES

#### 79. Tools

The American and Landis models of finishing machines are supplied with the tools shown in figure 132.

#### 80. Supplies

a. The following standard supplies are issued with the finishing machine:

Description	Quantity
Finisher oil .....	1 quart
F. S. sandpaper .....	18 cover
1-lee] breaster sandpaper .....	3 sheet
9 by 11 sandpaper .....	3 sheets
No. 6 burnisher covers .....	4
Grinding wheel, 60-2-12 .....	1

b. For additional supplies issued to the using organization, see paragraph 101.

#### 81. Accessories

In addition to the standard tools and supplies the following accessories are supplied with each model:

Description	Quantity
No. 1 stag belt hook .....	3
.1-inch black iron washers .....	8
2Y, by 74-inch leather belt .....	1
Yil by 2-inch machine belts (60-6-303A) .....	4

## PART TWO

### OPERATING INSTRUCTIONS

#### Section IV. SERVICE UPON RECEIPT OF EQUIPMENT

##### 82. New Equipment

*a* INSPECTION FOR DAMAGE IN SHIPMENT. Since the machine will be well protected for shipment, there is only a small chance of its being damaged. Frame and frame part are most likely to be injured. Inspect frame leg and cross member for cracked or broken parts. Tighten all bolts, screw, and nuts that have loosened in handling and transportation.

*b* REMOVAL OF CORROSION-PREVENTIVE MATERIAL. Part of the machine unprotected by paint

should arrive covered with a heavy lubricant. A mixture of Diesel fuel and machine oil containing not more than 15 percent machine oil serves well as a cleaning solution. Remove corrosion-preventive material with cleaning solution and a brush or coarse cloth.

*c* INSTALLATION. (1) *Model 102 and Model L* (figs. 129 and 130). (a) Examine flooring upon which the finisher is to be placed. If it is weak or unstable, brace or reinforce it. Each leg of the finisher must rest on a solid base and must be firmly secured. If floor is uneven, level the machine with wooden shingles or metal shims and fasten legs to floor with lag screws furnished for that purpose.

(b) When legs are secured, align the shafting. Shafts must be aligned correctly to prevent bearings from heating and sticking. Moreover, a poorly aligned shaft requires an excessive amount of power and will be a constant maintenance problem. Align main shaft (power shaft) first. Proper horizontal alignment can be determined by stretching a string from one leg of the frame to the other. Measured distance between the shaft and the string should be equal at all points. The shaft can best be aligned vertically by placing a spirit level on the top of the shaft. When the shaft is properly aligned, it will turn freely by hand when the belts are off.

(c) Align the upper shaft in the manner described in (b) above. When properly aligned, it should parallel the main shaft at all points. After the shafts are aligned put on the belt.

(d) The finisher countershaft (main shaft) should run at 850 revolutions per minute. The revolutions per minute of the motor will determine the diameter of the motor pulley required to run the main shaft. The following schedule will fit most machines:

Motor speed (r.p.m.)	Motor pulley diameter (in.)
1,750 to 1,800.....	4
1,450 to 1,500.....	5
1,100 to 1,200.....	6

(2) *Landis portable shoe repair line, Model 12 K-100 Special* (fig. 131). The unit is installed by unloading it from the repair trailer and setting it on some level base. (See book 5.) Align power shaft of unit and upper shaft of finisher.

*d* RUN-IN TEST. (1) Lubricate machine as prescribed in paragraphs 102 and 103.

(2) Connect electric motor with a power circuit (220-volt line is preferable). Move switch to ON.

(3) Engage clutches one at a time by raising the clutch lever handle. Check the alignment and clearing of the belt. The main shaft and upper shaft should turn freely without apparent end play or vibration. When edge trimmer clutch is engaged, the edge trimmer should start smoothly and run quietly.

(4) Run the machine until shaft and bearings appear to have worked in smoothly. Stop the machine. Remove belts. Shaft should turn freely by hand. Bearings should be cool. Check to see that bearing, clutches, and all nuts and screws are secure. If machine is found to be in satisfactory operating condition, replace belts.

##### 83. Used Equipment

Services performed upon the receipt of used equipment are the same as those described for new equipment.



ment in paragraph 82. In addition, bearings, clutch facings, and cutter head should be checked for evidence of excessive wear.

## Section V. CONTROLS AND INSTRUMENTS

### 84. Power Switch

The power switch may be located on the motor or on the front of the shelf of the finisher. (See 14, fig. 129.) When power is furnished by a generator, the switch is effective only when the generator is operating.

### 85. Clutches

*a* LANDIS PORTABLE SHOE REPAIR UNIT MODEL 12 K-100 SPECIAL. In this model the finisher has a single clutch control. (See 9, fig. 131.) Lift the handle to engage clutch. Lower the handle to disengage clutch.

*b* AMERICAN MODEL L. On the American Model L finisher (fig. 130), the blower, the upper shafts, and the edge trimmer unit have each a clutch control. Engage and disengage clutch as described in *a* above.

*c* LANDIS, 100 LINE, MonEL 102. On this model (fig. 129), the blower, the burnisher shaft, the sander shaft, and the edge trimmer unit each have a clutch control. Engage and disengage clutch as described in *a* above.

### 86. Edge Trimmer Brake

The edge trimmer brake is located in the center of the face of the edge trimmer unit. (See 1, fig. 129.) To stop the motion of the trimmer head after clutch has been disengaged, move brake handle to the left.

### 87. Edge Setter Friction Heater Control

The edge-setting irons are heated by a friction heater containing an asbestos friction element. The heater has two heating positions. When the control handle (15, fig. 129) is toward the rear, the heater may be left on continuously without overheating. To heat the edge setter quickly, the handle is moved toward the front. In this position the edge setter will overheat in a short time. When the heat control handle is at center between the forward and rear positions, it is at neutral and the heater does not generate heat.

## Section VI. OPERATION UNDER USUAL CONDITIONS

### 88. General

Operation of the finisher is a relatively simple process. The shoe is applied to the various operating wheels of the finisher in succession, until it is trimmed, sanded, and polished.

### 89. Edge Trimmer (fig. 133)

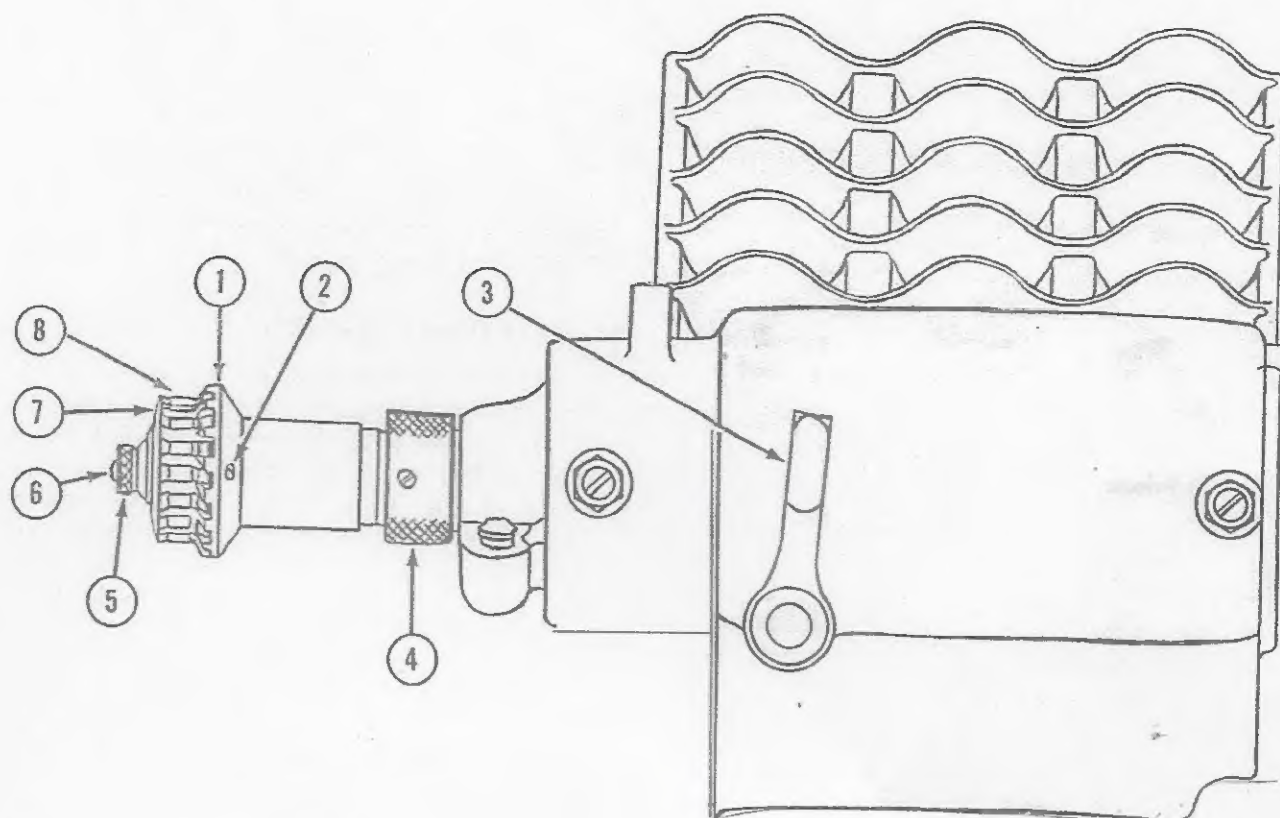
*a* OPERATION. Trimming the edges of the sole of the shoe is the first of the finishing operations. The edge trimmer cutter blades rotate at high speed. The sharp blades trim the edge of the sole of the shoe until the edge has a smooth finish. The operator grasps the upper of the shoe in the left hand and holds the heel of the shoe in the right hand. The sole of the shoe should be perpendicular to the floor. Hold the shoe directly under the cutter, and guide from one end around the toe and back around on the other side of the shoe.

*b* REPLACEMENT. (1) *Removal.* Release clamp nut. (See 5, fig. 133.) Hold the edge trimmer shaft with the brake lever (3) or by grasping the knurled back guard set collar (4) with the right hand. With the left hand turn the back guard (1) so that the top of it turns toward the operator. When the clamp nut (5) is released, remove cutter (8) and cutter shield (7) with fingers. Most trouble in removing cutters is caused by the cutters fitting too tightly on the shaft. If cutters do not turn on the shaft, it will be difficult to remove the clamp nut (5).

(2) *Installation.* Place cutter (8) on end of shaft. If it will not turn on shaft, remove and examine it for burs. If burs are found, remove them with sandpaper. If all cutters fit tightly and are not burred, polish the shaft slightly with sandpaper until cutters will turn on shaft. When the cutter fits properly on the shaft, push it onto shaft as far as it will go. Place cutter shield (7) on shaft. Tighten clamp nut ("5") by holding the back guard set collar with one hand and turning top of cutter away from operator. The cutter back guard (1) should be set so that the face of the guard is even with the inside level of the cutter (8). This adjustment is made with the back guard adjusting screw.

### 90. Heel Breaster (fig. 134)

*a* OPERATION. The heel breaster (1, fig. 134) is a revolving, conical sand wheel which is used to



Ref.  
No.

Nomenclature

- a. Edge trimmer cutter back guard.  
Edge trimmer cutter back-guard adjusting screw.  
b. Brake lever.  
c. Edge trimmer cutter back-guard set collar.

Ref.  
No.

Nomenclature

- 5 Edge trimmer clamp nut.  
6 Edge trimmer clamp screw.  
7 Edge trimmer cutter shield.  
8 Edge trimmer cutter.

Figure 133. Edge trimmer cutter replacement.

grind an even finish out of the breast of the heel (2) and the heel base of the shoe. The operator grasps the heel and quarter of the shoe with the right hand and holds the vamp and outsole of the shoe with the left hand. The shank of the shoe is held flat against the face of the heel breaster wheel.

b. REPLACEMENT OF SAND PAPER. Place pin wrench in pinhole (3) of shaft connection (4). Loosen shaft connection by turning top of it down toward the operator. Turn it until sand paper on heel breaster (1) is loose. Remove paper. Place new paper on heel breaster so that the upper flap of the paper passes up around the top of the heel breaster and points to the rear. Turn top of shaft connection (4) down and toward the rear until paper is held securely on heel breaster. Pressure of the heel breaster as it turns against the shoe will

tighten the shaft connection adequately.

## 91. Heel Sander

a. OPERATION. The heel sander (fig. 135) is a revolving sand wheel which sands the heel of the shoe down to a smooth, even finish. Grasp shoe with right thumb against heel breast of shoe and with fingers along the bottom of the heel. Point toe of shoe forward toward the operator. Guide shoe with left hand grasping quarter of the shoe. Turn the heel of the shoe against heel sander until the heel and heel base of the shoe are evenly finished.

b. REPLACEMENT OF SAND PAPER. (1) Removal (fig. 136). When paper becomes so worn that it is no longer effective, it should be replaced promptly so that the wood and felt of the sanding wheel are not damaged. Raise the hood of the heel sander (3),



*Nomenclature*

- |   |                           |
|---|---------------------------|
| 1 | Heel breaster.            |
| 2 | Heel breast               |
| 3 | Shaft connection pinhole. |
| 4 | Shaft connection          |

*Fig. 134 Heel breaster*



Figure 135. Heel sander operation

fig. 136) and the hood of the bottom sander (1). Turn upper shaft by hand until the opening joint of the heel sander is turned up and is facing the operator. Grasp bottom sander (2) with left hand to hold shaft securely. With right hand strike downward on lower segment of heel sander (7) to open segments in direction that shaft turns. When segments are loose in the collars (4) turn segments until segment pin (6) in segment coincides with notch (5) in collar. Lift segment up until the working space between the open ends of the segments is sufficient to remove paper. Lift ends of paper off the paper-retaining pin (1, 2, fig. 137) and remove paper from sanding wheel.

(2). *Installation* (fig. 137). Segments of the wheel should not be opened more than 2 inches when paper is being installed. If wheel is opened more than 2 inches and the paper is placed in position on the paper-retaining pins (1 and 2, fig. 137) the paper will be stretched too tight when the wheel is closed and will break down the corners of the segments.

Place one end of the new paper on the paper-retaining pins of the top segment of the wheel. Pass paper over the top of the wheel and down and up around the bottom segment. Fasten loose end of paper on retaining pin (2) in the bottom segment. Turn wheel in collars until segment pin (4) drops into notch (3) in wheel collar (5). Close wheel. Turn top of wheel to the rear and down until it is tight in the collars. Turning wheel to the rear secures it in the collars by turning segment pin into an eccentric groove on the inside of collar.

## 92. Bottom Sander

*a. OPERATION* The bottom sander (fig. 138) is a revolving-drum sand wheel which sands down and finishes the shank of a leather soled shoe. Grasp the quarter of the shoe with right hand. Place toe of shoe toward the floor and shank of shoe toward sander. Guide shoe with left hand along the vamp of left side of shoe, holding shank of shoe upon sander.



Fig. 136

#### Nomenclature

- 1 Bottom sander hood.
- 2 Bottom sander.
- 3 Heel sander hood.
- 4 Sanding-wheel collars.
- 5 Retaining notch.
- 6 Segment pin.
- 7 Lower segment.

Figure 136. Removal of heel sander paper.





*Nonmetallic*

- 1 Upper segment paper-retaining pins
- 2 Lower segment paper-retaining pin
- 3 Retaining notch in collar.
- 4 Segment pin.
- 5 Collar.

*Figure 137. Installation of the sander paper*



Figure 138 Bot 011 1114

**c. REPLACEMENT OF PAPER** Follow procedure described in paragraph 91b for Landis, 100 Line, Model 102.

### 93. Finishing Brush

**a. OPERATION** Ink is applied to the part of the shoe that requires it. The shoe is then held against the revolving finishing brush (fig. 139) until it is dry and polished.

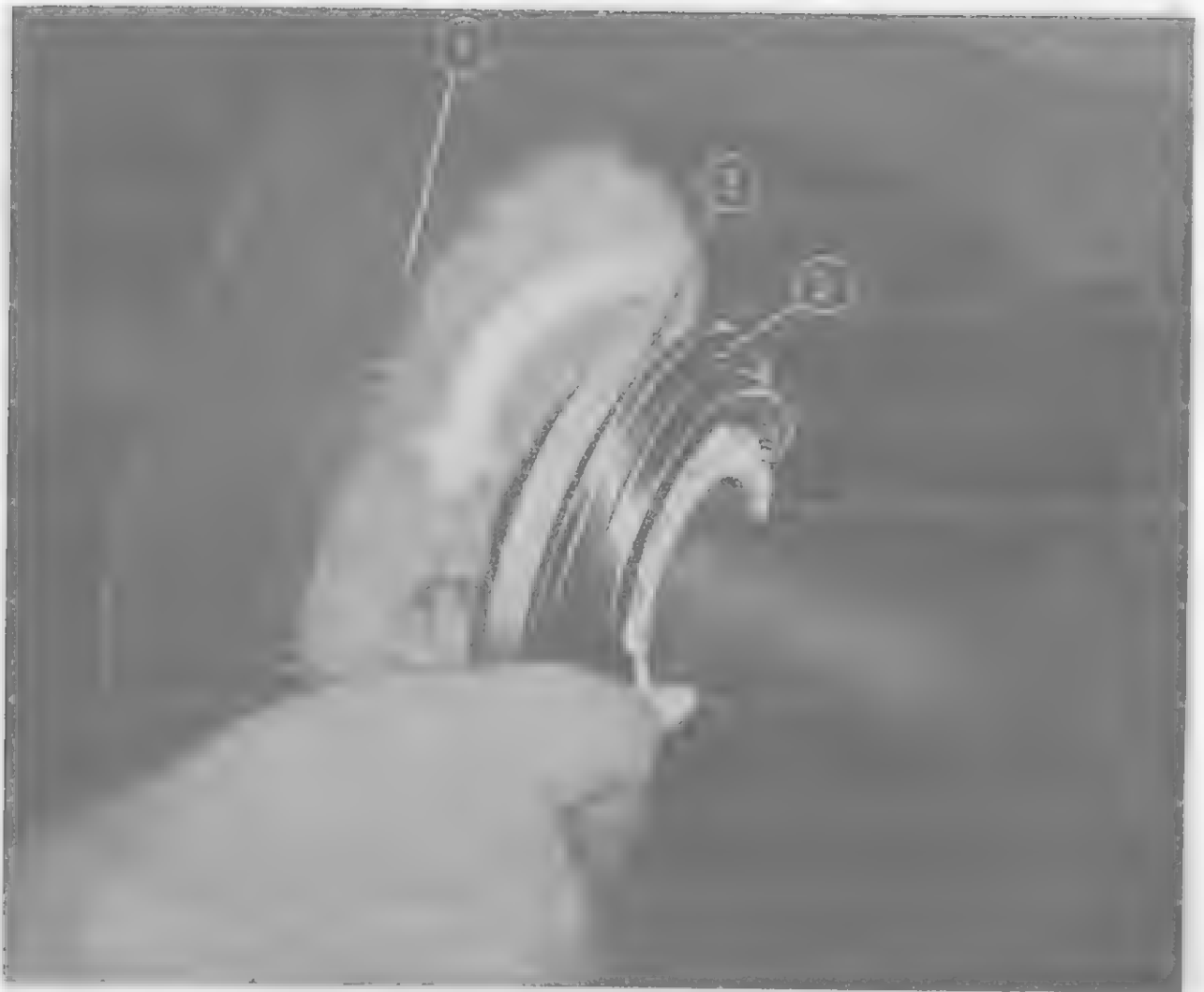
**b. REPLACEMENT** See paragraph 120.

### 94. Burnisher Wheel

**a. OPERATION** The burnisher wheel is a cloth covered wheel which rotates with the upper shaft. After burnishing wax is applied to the cloth cover of the wheel, the operator buffs and waxes the edges of the shoe against the rotating wheel.

**b. REPLACEMENT (1)** Use spanner wrench (3, fig. 140) to release retaining collar (2) at side of burnisher wheel. Turn top of collar forward and down, unwrap burnishing cloth (1, fig. 140) from wheel, lifting binding cord (1, fig. 141) free of notch in wheel in which it was anchored.





1.

1. Burnishing cloth.

2.

2. Cloth-retaining collar.

3.

3. Spanner wrench.

Figure 140. Removing burnishing cloth



No	Nomenclature
1	Binding cord
2	Burnishing wheel.
3	Burnishing cloth.
4	Cloth-retaining collar

Figure 141. Appl-ying blimushilg



(2) Place new burnishing cloth (3, fig. 141) on wheel. Anchor binding cord (1, fig. 141) in notch in wheel. Pass cloth over the top of the wheel and down behind it. Bring loose end of cloth up around front of wheel so that when cloth laps on the wheel, the lap will point to the rear when lap is at top of wheel. Turn retaining collar (2, fig. 140) up against wheel so that burnishing cloth and binding cord are secured. (See fig. 142.) Tighten retaining collar (2, fig. 142) with spanner wrench (3, fig. 142) by turning top of collar to the rear. Cut free end of binding cord close to retaining collar.



Ref

Temperature

- 1 Binding cord.
- 2 Burnishing cloth.
- 3 Cloth-retaining collar.

Figure 142. Securing burnishing cloth

(3) When burnisher wheel is in motion, apply burnishing wax to the covered burnisher wheel. (See fig. 143.)

### 95. Edge Setter (fig. 144)

*a. OPERATION* The rotating, friction heated edge setter (1, fig. 144) applies hot wax to the edges of the soles of the shoe to darken and waterproof them. The edge setter is heated by the friction created against an asbestos friction element, the heat being controlled by the heat control handle (2). When the handle is straight up, the friction element is in

neutral and no heat is generated. Pushing the control handle to the rear places the heater in operating position. In this position the heater will generate enough heat for proper operation and will not overheat under continuous use. To warm the friction heater quickly, pull the control handle (2) forward. This position should be held only until proper operating temperature is reached and then the handle should be pushed to the rear. The friction element will overheat if control handle is left in forward position too long. When the edge setter (1) is at the proper operating temperature, grasp the shoe with both hands and press edges of sole of shoe against the rotating edge setter. Hold shoe in such a way that fingers cannot slip against the whirling edge setter. Turn shoe until entire edge of the sole is evenly finished.

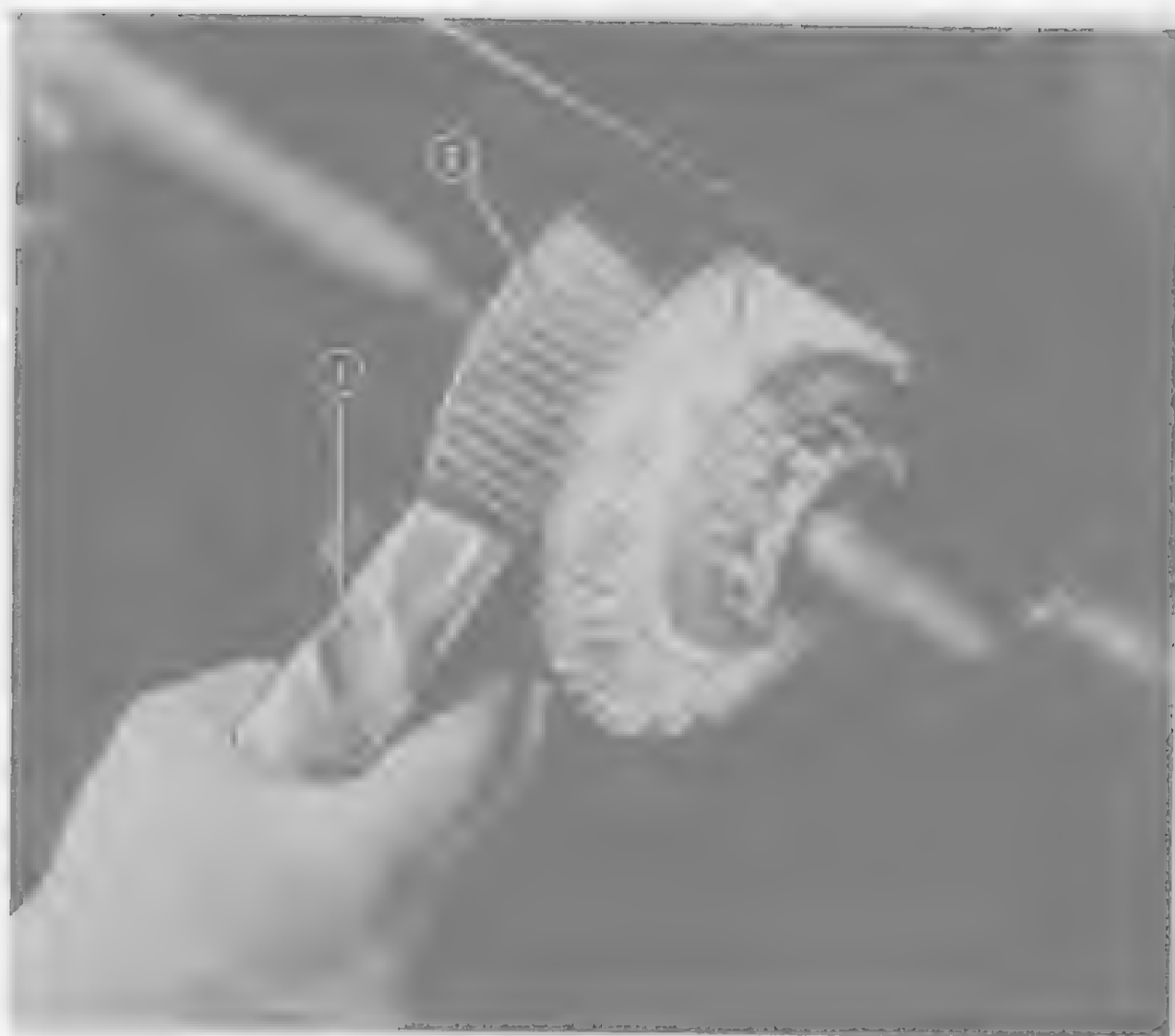
*b. REPLACEMENT* (1) *Removal.* Set heat control handle (2, fig. 144) in neutral (straight up) and press heat control unit away from edge setter (1) as far as it will go. Grasp edge setter (1) and turn it forward and down until eccentric groove within it is released from pin on haft. As edge setter is turned, pull it toward outward end of shaft. When notch on side of edge setter coincides with pin on shaft, edge setter will slide off end of shaft.

(2) *Installation.* Place edge setter (1, fig. 144) raised side inward, against outward end of shaft and then turn to the rear and down. When notch in side of edge setter coincides with pin on shaft, edge setter will slide into place on shaft. Continue to turn edge setter until it is tight on the shaft. Press heat control handle (2) toward edge setter until it is snug against it. Press heat control handle to rear and then return it to neutral position to be sure friction element is in contact with edge setter which will become tighter in use as it turns against the shoe pressed against it.

## Section VII. OPERATION UNDER UNUSUAL CONDITIONS

### 96. General

The simple, straight line construction and operation of the finishing machine make it relatively unaffected by any extremes in humidity or temperature that the operator could endure.



Nomenclature

- 1 Burnishing wax.
- 2 Burnisher wheel.

Figure 143 Waxing burnisher wheel



## 99. Procedures

a. REMOVAL. Every attempt should be made to move this equipment into a safe position. If removal is impossible, the finisher and its supplies must be so thoroughly demolished that nothing will be useful to the enemy.

DESTRUCTION Use an ax or ledge to smash motor clutches, finishing wheels, shaft bearings, blower, and edge trimmer assembly beyond repair. Break or bend main shaft and upper shafts. Mash the cat iron legs and junctions of the frame. Remove belts. Burn all inflammable supplies. Bury tools spare parts, and noncombustible supplies.

## PART THREE

### MAINTENANCE INSTRUCTIONS

#### Section IX. SPECIAL ORGANIZATION TOOLS AND EQUIPMENT

##### 100. Tools

Tools furnished with the finishing machine are shown in figure 132.

##### 101. Supplies

The using organization is issued a 6 months' supply of the following spare parts and supplies:

Description	Quantity
F. S. heel sander (wood and felt) . . . . .	2
Bottom sander (wood and felt), 9 inch. . . . .	2
Belting and hooks (complete set) . . . . .	1
Edge trimmer retaining screws . . . . .	2
Grease, lubricating, cup, medium grade . . . . . pounds . . .	12
Oil, lubricating, No. 300A . . . . . gallons . . .	10
Brushes, inking, four-row . . . . .	10
Wheels, abrasive . . . . .	40
Stones, sharpening . . . . .	15
Cloth and paper, combination, abrasive . . . . . sheets . . .	200
Cloth and paper, combination, heel breaster . . . . . pieces . . .	360
Ink, burnishing, brown . . . . . gallons . . .	7
V. I. ax, shoemaker's, finishing, brown . . . cakes . . .	150
Covers, roll, shoe finishing . . . . .	200
Cutters, edge-trimming machine . . . . .	24
Fields, cutter . . . . .	12

#### Section X. LUBRICATION

##### 102. Lubrication Chart

a. The lubrication charts presented in figures 145 and 146 prescribe first and second echelon lubrication maintenance.

b. The service intervals specified in the lubrication

charts are for normal operating conditions. Under extreme conditions, such as excessively high or low temperatures, prolonged periods of high speed, continued operation in sand or dust, immersion in water, or exposure to moisture, the intervals should be reduced. Failure to reduce them may result in malfunctioning or damage to the machine.

c. The lubricants prescribed in the KEY for use on this machine are to be used at all temperatures.

##### 103. Detailed Lubrication Instructions

a. LUBRICATION EQUIPMENT. Each finishing machine is supplied with lubrication equipment adequate to maintain it. Make certain the lubrication equipment is cleaned both before and after use. Operate the equipment carefully and in such a manner as to insure a proper distribution of the lubricant.

b. POINTS OF APPLICATION. Oilholes and grease cups are readily located by reference to the lubrication chart, which is supplemented by individual photographs of the points of lubrication. (See figs. 147 to 152, inclusive.) Wipe all points and surrounding surfaces clean before applying the lubricant.

c. CLEANING. Use dry cleaning solvent or Diesel fuel oil to clean or wash all parts. Use of gasoline for this purpose is prohibited. After washing, dry all parts thoroughly before applying lubricant.

d. LUBRICATION NOTES ON INDIVIDUAL UNITS AND PARTS. (1) *Trimmer*. Every day lubricate the two upper and the two lower shaft bearings with oil. Pour oil into the upper oil cup until it runs from the lower oilhole which opens out of the reservoir at the oil level.

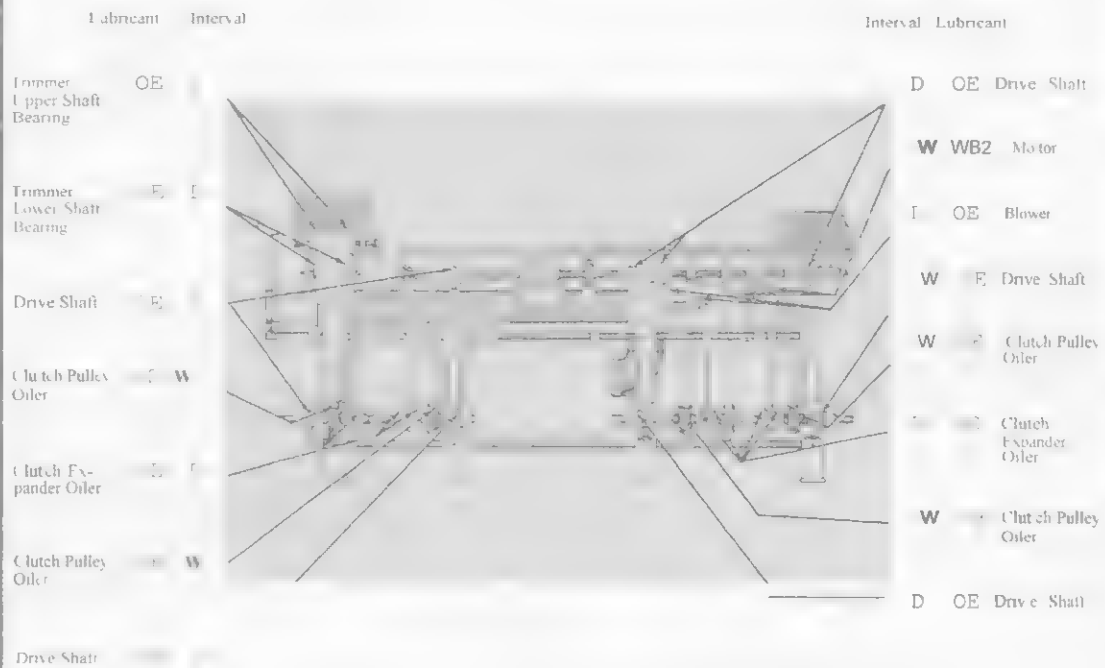
(2) *Drive shaft*. Every week lubricate the eight drive shaft bearings by adding oil to the top of the upper oilholes.

(3) *Clutch expander oilers*. Every day lubricate the four clutch expander outer sleeve oilers and the four clutch expander inner sleeve oilers with



# LUBRICATION CHART

## MACHINE, FINISHING (LA NDIS- 102 / AMERICAN-"L")



### -KEY AND NOTES-

LUBRICANT	INTERVAL
OE- OIL, engine OE 10	O Daily
WB2-GREASE general purpose No 2	W Weekly

Clean parts with SOLVENT, dry-cleaning or OIL, fuel Diesel.  
Dry before lubrication.

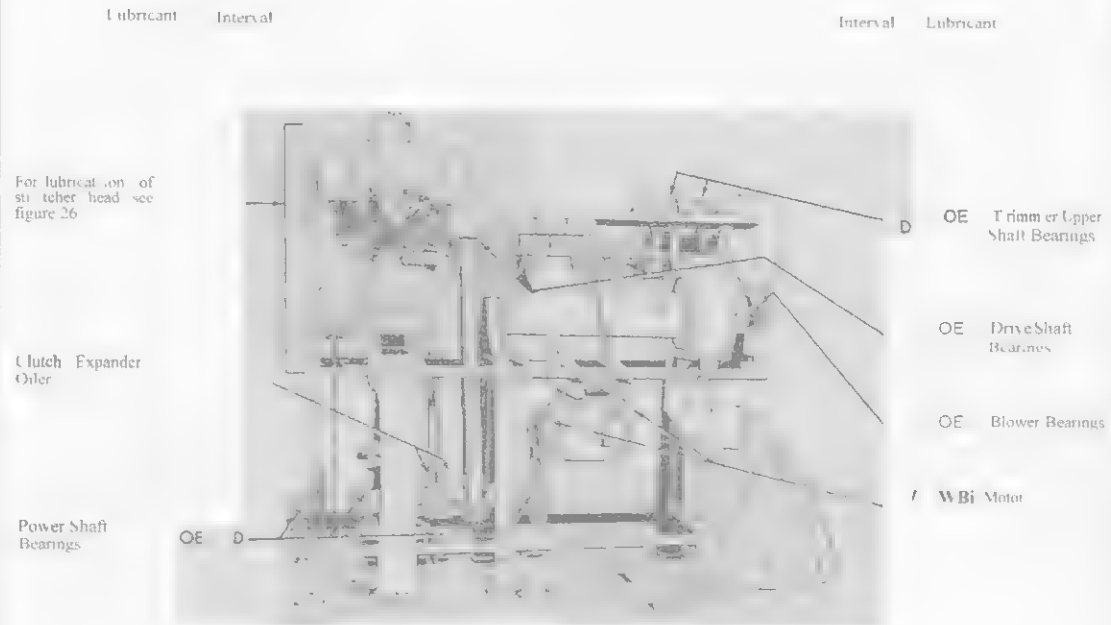
Reduce intervals under severe operating conditions. Extend when not in use.

Most of the oil reservoirs indicated above are equipped with secondary oil holes. Pour oil into the upper oil cup until the oil runs from the lower oil hole, which opens out of the reservoir at the oil level.

Figure 145 Lubrication chart-Landis 102 and American L

# LUBRICATION CHART

## PORTABLE SHOE REPAIR UNIT (LANDIS MODEL 12 K-100 SPECIAL)



### -KEY AND NOTES-

LUBRICANT	INTERVAL
OE- OIL -minic-OE 10	Daily
WB3-GREASE -General purpose No 2	Weekly

Clean parts with SOLVENT dry-cleaning or OIL fuel oil, diesel  
before lubrication

Reduce intervals under severe operating conditions. Extend when not

Most reservoirs indicated above are equipped with secondary  
holes. Pour the upper oil cup until the oil runs from the lower oil  
hole. Such happens out of the reservoir at the oil level.

Figure 146. Lubrication chart-Landis 12 K-100 Special.

oil. Every week the reservoir should be drained and filled to the top of the reservoir with new oil.

(4) *Clutch pulley Oiler*. Every week add oil to the four clutch pulley oilers until the reservoir is filled and the wicks are saturated.

(5) *Blower*. Every week lubricate the blower bearings by adding oil to the two blower oil cups. Pour oil into the upper oil cup until oil runs out of the lower oilhole which open out of the reservoir at the oil level.

(6) *Motor*. Every week add grease to the two grease fitting on the motor.

c. REPORTS AND RECORDS. (1) A record of lubrication may be maintained on VVD AGO Form 460.

(2) Report unsatisfactory performance of equipment and lubricants on VVD AGO Form 468, to the Reclamation Branch, Field Service Division, Office of The Quartermaster General, in accordance with pertinent War Department circulars.



Figure 148. Drive shaft bearings



Figure 147. Edge trimmer bearings



Figure 149. Clutch oiler



Figure 150



Figure 1-2. Motor.



Figure 151

## Section XI. PREVENTIVE MAINTENANCE

### I 04. General

Preventive maintenance services are performed by the maintenance personnel of the user organization. These services consist generally of before-, during-, and after-operation services performed by the operator; and the scheduled weekly and monthly services performed by organizational maintenance personnel.

### I 05. Operator Maintenance (First Echelon)

a. BEFORE-OPERATION SERVICE. (1) *General.* This service is performed primarily to see that the machine has not been damaged or tampered with since the after-operation service (see below) was performed. In addition, it includes such services as are required to put the machine in proper condition for operation.

(2) *Lubrication.* Lubricate the points of the machine as prescribed in figures 147 through 152.

(3) *Bearing alignment.* Remove belts and turn shafts by hand. All shafts should turn freely. Binding of any shaft should be reported to unit mechanic. If bearing alignment is satisfactory, replace belts.

(4) *Belt alignment.* Start motor. Belts should ride evenly and center on crest of their pulleys. Belts should run between pulleys in a straight line.

(5) *Clutch action.* Engage each clutch with the clutch control lever. Clutch should engage smoothly and completely. Disengage clutch. Power transmission should cease smoothly and quickly. If clutch drags or binds or does not engage completely, notify unit repairman and adjust as described in paragraph 111.

(6) *Hood clearance.* Check hood of finishing wheels to see that they are secure in their hinge. Make certain that clearance between finisher wheels and their hoods is adequate.

(7) *Changing wheel coverings.* Examine the paper or abrasive cloth on the sanders and the cloth cover of the burnisher. Sandpaper should carry enough grit to be effectively abrasive, and paper should be sturdy enough to protect wood and felt of sanding wheels. The burnisher wheel cover should be in such condition that it will take the burnishing wax and will protect the burnishing wheel. When necessary, change wheel covers as described in paragraphs 91, 92, and 94.

*b. DURING-OPERATION SERVICE.* (1) *General.* An operator familiar with his machine quickly notices small changes in the sound or feel of its operation. If such a change is noticed, the operator should stop the machine and locate the cause by running the machine over slowly and closely observing the operation of its parts.

(2) *Clutch action.* Clutches on finishing machine are relatively simple. Once correctly adjusted, they should cause little further trouble. They should engage and disengage smoothly and completely. If they do not, they should be adjusted by unit mechanic according to instructions in paragraph 111. Clutches are commonly blamed for a slippage which actually occurs in the belting on the machine.

(3) *Belt tension.* Belt tension may slacken so much that finishing shafts run below speed when shoes are pressed against finishing wheels. This condition is most likely to occur where humidity of air is high or when a new belt has been run in and has loosened. Belt tension and alignment should be adjusted by unit mechanic as described in paragraph 122.

*c. AFTER-OPERATION SERVICE.* (1) *General.*

In the after-operation service the operator inspects his machine for any deficiencies which may have developed during operation. He corrects those which he is permitted to handle and reports any other deficiencies to the unit mechanic or the authority responsible for maintenance of the finishing machine. The operator also performs those services on the machine which arise as a result of normal operation. After-operation service is designed to leave the machine ready for operation whenever it may be needed.

(2) *Cleaning dust collector bag.* (a) *General.* When the finishing machine is installed in van type trailers, the discharge pipe from the blower passes

through the floor of the trailer and discharges dust outside the trailer. Instructions included here apply to finishing machines operating in fixed installations.

(b) *Cleaning procedure.* When blower fan is not running, shake dust collector bag and remove cleaning drawer. To shake the dust collector bag properly, slap sides of bag against sides of dust collector by pushing the haker handle in and allowing the bag to fall away from the collector screen. Then snap shaker handle forward and back with a slight pause at the end of each stroke. This procedure gives the bag a rocking motion, slapping it from front to rear against collector screen. Thorough beating of the bag causes the dust to fall to bottom of dust collector. Start blower fan and run it a few seconds to blow dust into the clean-out drawer. Stop blower fan. Repeat this shaking and blowing operation two or three times at each cleaning. Under normal operating loads, the bag should be shaken about twice a day. Empty clean-out drawer when full about once a day in normal operation.

(3) *Bearing alignment.* See a(3) above.

(4) *Belt alignment.* See a(4) above.

(5) *Clutch action.* See a(5) above.

(6) *Hood clearance.* See a(6) above.

(7) *Changing wheel coverings.* See a(7) above.

## I 06. Organization Maintenance (Second Echelon)

*a. GENERAL.* Regularly scheduled maintenance inspections and services are a preventive maintenance function of the using unit. They are the responsibility of commanders of the operating organizations or installations.

*b. FREQUENCY.* The intervals between the pre-



ventive maintenance services listed here are considered a minimum requirement for the normal operation of the machine. Under unusual operating conditions, such as extremely dirty surroundings, it may be necessary to perform certain maintenance services more frequently.

c. **FIRST ECHELON PARTICIPATION.** The operator should be at his machine and assist the unit mechanic while second echelon preventive maintenance services are performed.

d. **PROCEDURES.** (1) *Weekly.* (a) *Running tests.*

1. *Belts.* Belts should run over crests of pulleys, without creeping from side to side. They should run in straight line from one pulley to the other and should be tight enough so that when work is pressed against finishing wheels, they do not slip and allow loss of motion in finishing shaft. (For adjustment of belts see par. 122.)

2. *Clutches.* Engage and disengage each clutch. It should engage and disengage smoothly and completely. Power transmission should be continuous and even. (For adjustment of clutches see par. 111.)

(b) *Hand operation tests.*

1. *Bearings.* Remove belts. Turn main shaft and finishing shafts by hand. Shaft should turn freely without binding. Bearings should not be warm to the touch after machine has been operated. Shafts should be free from end play. Check shaft set collars to see that they are tight and in correct position in relation to shaft bearings. If binding is found in bearings, adjust as described in paragraph 82c.

2. *Finishing wheel hoods.* Check hoods to see that they are secure in their hinges. Hood should clear finishing wheels in order not to damage the moving wheels.

3. *Motor.* See that housing and support of motor are clean. Check alignment of motor pulley and power shaft pulley. Unit mechanic should not attempt to repair mechanical failure within the motor.

(2) *Monthly tests of nuts and bolts.* Check tight-

ness of all nuts and bolts on machine. Normal vibration of the finishing machine in operation may loosen nuts and bolts enough to cause failure to operate or damage to the machine.

## Section XII. TROUBLE SHOOTING

### I 07. General

This section contains trouble shooting information which can be of help in determining and removing the causes of trouble that may develop in this machine. The principal symptoms of trouble are loss of motion and excessive vibration. Paragraph 108 lists the causes for loss of motion and their remedies. Paragraph 109 lists the causes for excessive vibration and their remedies.

### 108. Causes and Remedies for Loss of Motion

Possible cause	Remedy
Slipping clutch	Check engagement of clutches and adjust if necessary. (See par. 111.)
Slipping belts .....	Check tensions of belts. Start with power shaft drive belt. (See 21, fig. 129.) Then check remaining belts and tighten if necessary. (See par. 122.)

### I 09. Causes and Remedies for Excessive Vibration

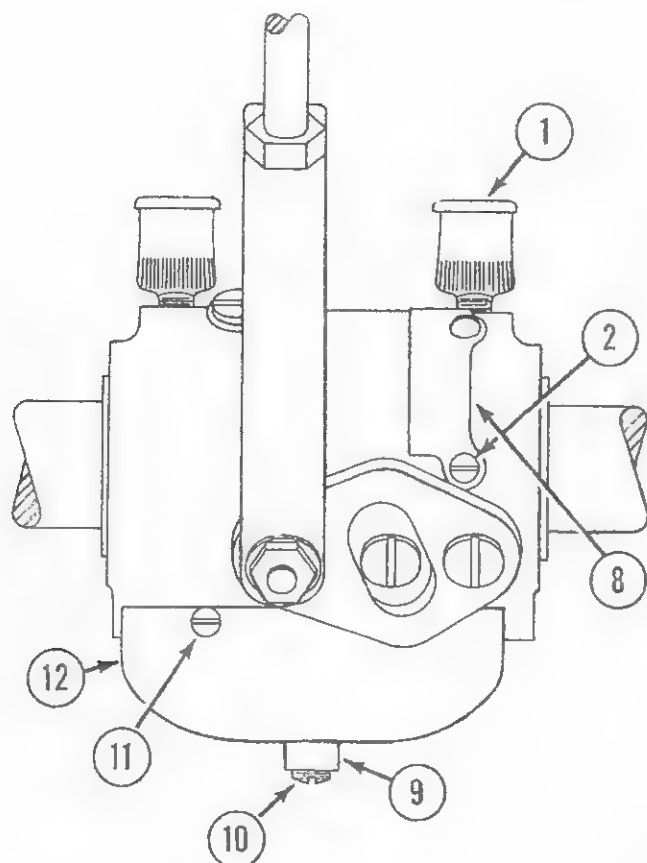
Possible cause	Remedy
Unbalanced condition due to improper position of wheels on finishing shaft.	Engage clutch of each finishing shaft separately. If shaft vibrates excessively, adjust finishing wheels on it so work load on shaft is evenly distributed.
Binding of bearings on shaft.	Remove belts. Shafts should turn freely by hand. If shaft binds in bearing, align bearings on that shaft. (See par. 82.)
Badly worn or poorly patched belt.	Check condition of all belts. Once at a time, remove belts which are in such poor condition that they might be causing excessive vibration. Operate machine with defective belt removed. If vibration is no longer present, replace old belt.

## Section XIII. CLUTCH ASSEMBLY

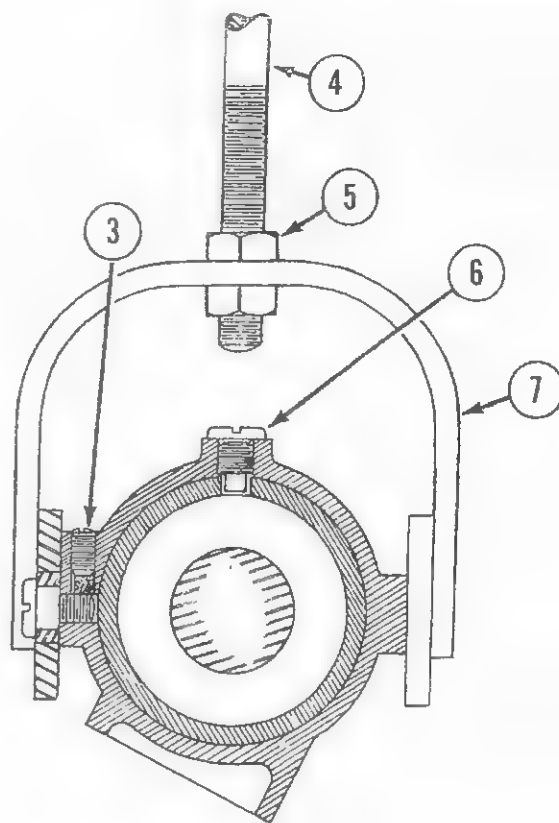
### 110. Description

Clutches on Landis, 100 Line, Model 102 and American Model L finishing machines are similar in

operation but slightly different in construction. The Landis finisher has a friction disk clutch (fig. 153) and the American finisher has a friction cone clutch (fig. 154)



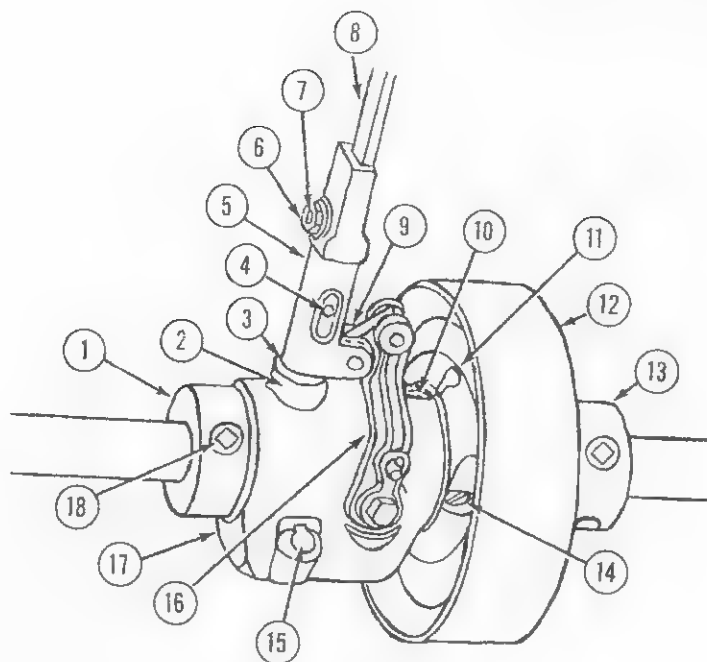
Side view.



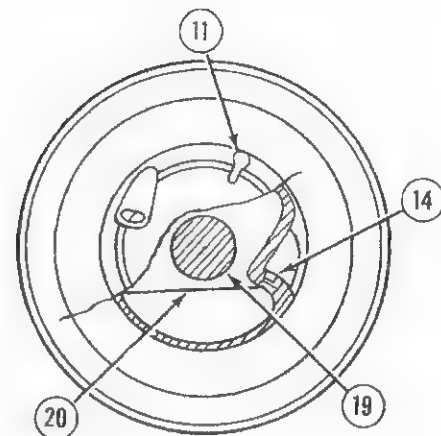
End view.

Part No.	Vendor's part No.	Vendor's nomenclature
1	7-913N	Clutch expander inner sleeve oiler.
2	7-313N A	Clutch body dust guard setscrew.
3	7-313I	Clutch expander cam roll stud setscrew.
4	7-13U	Clutch expander rod.
5	7-313U	Clutch expander rod adjusting nut.
6	7-313L A	Clutch expander sleeve screw.
7	7-13R	Clutch expander fork.
8	7-613N A	Clutch body dust guard.
9	7-113I	Clutch drain plug bushing.
10	7-913I	Clutch oil drip pan plug.
11	7-313L B	Clutch oil drip pan setscrew.
12	7-613L	Clutch oil drip pan.

Figure 153. Clutch (Landis 100 Line model 102)



External view



Sectional view

Ref. No.	Vendor's part No	Vendor's nomenclature
1	CP-19	Clutch set collar (with screw).
2		Clutch housing boss.
3		Positioning point "x" for spacer.
4	CP-13C	Stop pin.
5	CP-13	Rod end.
6	CP-13H	Jam nut.
7	CP-13G	Clutch rod connecting screw.
8		Clutch rod
9	CP-13D	Link.
10		Witness mark on housing.
11		Witness mark on pulley.
12	CP	Clutch pulley.
13	CP-15	Cone driver.
14		Pipe plug for oiling pulley.
15		Oil cup.
16	CP-11	Clutch yoke
17		Clutch housing.
18		Clutch set collar setscrew.
19		Power shaft.
20		Oil level

Figure 154. Clutch assembly (American).

### III. Adjustment (fig. 154)

There are four basic adjustments on the clutch which must be made correctly and in proper sequence to secure efficient clutch operation.

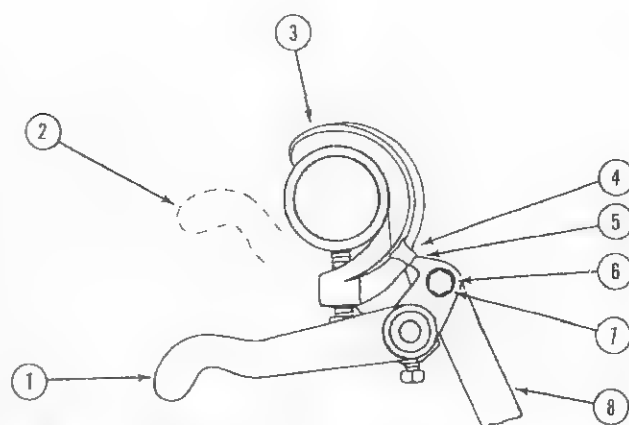
a. *Cone driver.* Set cone driver (13, fig. 154) so that clutch pulley (12) lines up with top shaft pulley.

b. *Set collar.* Set the set collar (1) so that clutch will have proper release when disengaged. There are two ways of setting set collar.

(1) Disengage clutch and release set collar setscrew (18). Push clutch pulley (12) and set collar (1) against cone driver (13). Back set collar away from cone driver about 1/16 inch and lock set collar. The setscrew in the set collar should lock on the flat milled in the power shaft.

(2) Set a 7/32-inch spacer (a square or round rod) on top of housing boss (2). Engage clutch. Spacer will then be clamped between rod end (5) and housing boss (2). Push pulley and set collar against cone driver. Lock set collar setscrew on milled flat in power shaft. Use of the 7/32-inch spacer establishes a definite release of clutch pulley when clutch is disengaged. Release should be a full 1/16 inch.

c. *CLUTCH AND CONE DRIVER.* The pipe clamp bracket should be set so that the bottom of cored slot in rod end (5) touches stop pin (4) in housing post, allowing clutch to swing away from cone driver when clutch is disengaged. To make this adjustment, disengage clutch when power shaft is running. Release pipe clamp (3, fig. 155) and pull clutch rod (8, fig. 154) up so that rod end (5) is against stop pin (4). Set pipe clamp on top pipe so that pulley swings away from cone driver (13). Turn pipe clamp on pipe until the stop (5, fig. 155) on hand lever touches abutment on pipe clamp. Lock pipe clamp. The purpose of the above adjustment is to bring the rod end into proper position and then to set stops on pipe clamp and hand lever to a position in accordance with that of the rod. When the power shaft is running and the clutch is disengaged, the clutch pulley should ride against the set collar.



Ref. No.	Vendor's part No.	Vendor's nomenclature
1	CP-17	Clutch-operating hand lever.
2	CP-17	Hand lever position when clutch is engaged.
3	CP-16	Pipe clamp.
4		Pipe clamp abutment.
5		Hand lever stop.
6	CP-17C	Clutch rod connecting screw.
7	CP-17E	Clutch rod connecting screw spring.
8		Clutch rod.

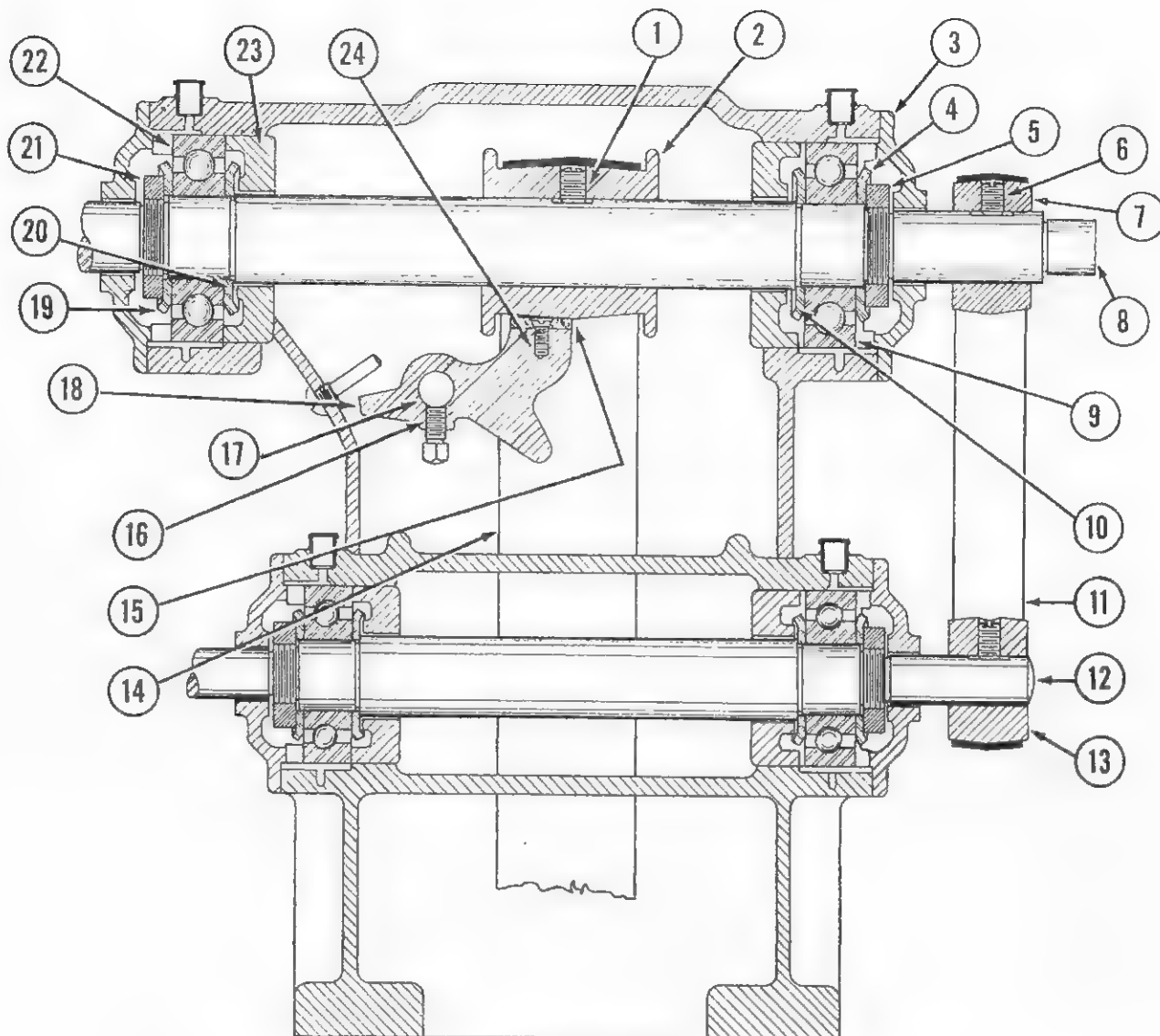
Figure 155. Clutch-operating hand lever (American).

d. *CLUTCH HOUSING.* The clutch housing floats on pulley when clutch is engaged. To permit free action of the housing, the connections of clutch rod (8, fig. 154) to the rod end (5) and clutch handle are not clamped tight. The screw (7) at rod end should be brought up to clamp the rod and then backed off one-half turn and locked with jam nut (6). The screw (6, fig. 155) in the clutch handle, connecting the clutch rod and handle, is tightened to compress the spring (7) about one-third its length. Lock it at that position with the jam nut. The spring checks vibration and tends to hold pulley away from cone driver when pipe clamp is properly set.

## Section XIV. EDGE TRIMMER ASSEMBLY

### 112. Description

The edge trimmer assembly is seldom disassembled. The unit mechanic is usually concerned only with the edge trimmer cutter (par. 89) and the cutter grinder. (See pars. 115, 116, and 117.) However, it may be necessary to replace bearings on upper trimmer shaft. (See 8, fig. 156.) The partial disassembly and assembly required to perform that service are included in this section. Since the heel trimmer of the edge trimmer assembly is not used by the Army, it is not included in instructions in this section.



Ref. No.	Vendor's part No.	Vendor's nomenclature	Ref. No.	Vendor's part No.	Nomenclature
1	2-305E	Edge trimmer upper pulley set-screw.	12	2-401SA	Heel trimmer shaft.
2	2-5	Edge trimmer upper pulley.	13	2-6	Heel trimmer driven pulley.
3	2-1B1	Upper shaft bearing cap.	14	2-19	Trimmer driving belt.
4	2-601B'	Outer upper shaft right-hand bearing oil flinger.	15	2-918	Brake friction stripe.
5	2-1C	Upper shaft right-hand bearing retaining collar.	16	2-318SA	Trimmer brake setscrew.
6	2-305F	Heel trimmer drive pulley set-screw.	17	2-418SA	Brake shaft.
7	2-5A	Heel trimmer drive pulley.	18	2-18	Edge trimmer brake.
8	2-401S	Upper trimmer shaft for grinding wheel.	19	2-601B	Outer upper shaft left-hand bearing oil flinger.
9	2-901E	Upper shaft ball bearing.	20	2-601B	Inner upper shaft left-hand bearing oil flinger.
10	2-601B	Inner upper shaft right-hand bearing oil flinger.	21	2-1C1	Upper shaft left-hand bearing retaining collar.
11	2-20	Heel cutter belt.	22	2-901E	Upper shaft ball bearing.
			23	2-1C2	Upper shaft bearing retaining plug
			24	2-318SC	Trimmer brake strip screw.

Figure 156 Edge trimmer assembly.

### 113. Disassembly (fig. 156)

- a. Remove belt from edge trimmer upper pulley. (See 2, fig. 156.)
- b. Remove cutter-grinder retaining screw and then remove cutter grinder from right-hand end of upper trimmer shaft (8).
- c. Remove edge trimmer cutter grinder (par. 89) from left-hand end of upper trimmer shaft.
- d. Remove belt guard retaining screws and remove belt guard and cutter-grinder shield attached.
- e. Since heel trimmer is not normally used by the Army, heel trimmer drive pulley (7) normally will not be in place on upper shaft as shown. If it is in place, loosen setscrew (6) and remove pulley from right-hand end of upper shaft.
- f. Remove retaining screws in right-hand upper shaft bearing cap (3) and remove bearing cap.
- g. Remove retaining screws in left-hand upper shaft bearing cap and remove bearing cap.
- h. Release edge trimmer brake (18).
- i. Turn edge trimmer shaft (8) by hand until setscrew in edge trimmer upper pulley (2) can be reached with screw driver. Loosen setscrew until it clears shoulders of flat milled in shaft.
- j. Remove upper shaft left-hand bearing retaining collar (21) by turning it on shaft until it is free of the threads holding it on the shaft.
- k. From right-hand side of edge trimmer assembly pull edge trimmer shaft out of assembly until left-hand end of shaft is free of left-hand shaft bearing.
- l. Remove outer upper shaft left-hand bearing oil flinger (19).
- m. Remove left-hand upper shaft ball bearing (22).
- n. Remove inner left-hand upper shaft bearing oil flinger (20).
- o. Continue to pull upper shaft to the right until left-hand end of upper shaft is about to pass through right-hand upper shaft bearing.
- p. Insert hand through hole in edge trimmer hood and remove edge trimmer upper pulley (2) from end of shaft.

q. Continue to pull upper shaft to right until it passes through right-hand upper shaft bearing and is clear of edge trimmer assembly. (Upper shaft right-hand bearing retaining collar (5) is left on shaft to act as key to proper position of shaft in assembly of the edge trimmer unit.)

r. Remove outer right-hand upper shaft bearing oil flinger (4).

s. Remove right-hand upper shaft ball bearing (9).

t. Remove inner right-hand upper shaft bearing oil flinger (10).

### 114. Assembly (fig. 156)

- a. Place outer right-hand upper shaft bearing oil flinger (4) on left-hand end of upper shaft.
- b. Place right-hand upper shaft ball bearing (9) on left-hand end of upper shaft.
- c. Place inner right-hand upper shaft bearing oil flinger (10) on left-hand end of upper shaft.
- d. Push the three parts (a, b, and c above) along shaft until they are snug against upper shaft right-hand bearing retaining collar (5).
- e. From the right, insert left-hand end of upper shaft through right-hand upper shaft bearing retaining plug (23).
- f. Pass edge trimmer upper pulley (2) through hole in edge trimmer hood, and place pulley on end of upper shaft as it emerges from upper shaft bearing retaining plug.
- g. Pass upper shaft on through edge trimmer assembly until left-hand end of shaft passes through left-hand upper shaft bearing retaining plug (23).
- h. Place inner left-hand upper shaft bearing oil flinger (20) on left-hand end of upper shaft.
- i. Place left-hand upper shaft ball bearing (22) on left-hand end of upper shaft.
- j. Place outer left-hand upper shaft bearing oil flinger (19) on left-hand end of upper shaft.
- k. Place upper shaft left-hand bearing retaining collar (21) on left-hand end of upper shaft.
- l. From the right, pass upper shaft on through edge trimmer assembly until upper shaft right-hand bearing retaining collar (5) holds upper shaft right-

hand bearing and oil flinger assembly in position against upper shaft right-hand bearing retaining plug (23).

*m.* Move edge trimmer upper pulley (2) on upper shaft until edge trimmer upper pulley setscrew (1) is in position over flat milled on shaft. Tighten setscrew.

*n.* Move upper shaft left-hand bearing and oil flinger assembly to the right on upper shaft until assembly contacts upper shaft left-hand bearing retaining plug (23).

*o.* Move upper shaft left-hand bearing retaining collar (21) right on upper shaft until collar strikes threads on upper shaft.

*p.* Turn retaining collar on threads until collar holds upper shaft left-hand bearing and oil flinger assembly in position against upper shaft left-hand bearing retaining plug.

*q.* Slide upper shaft left-hand bearing over left-hand end of upper shaft. Place bearing cap in position on bearing housing. Insert bearing cap retaining screws and tighten them securely.

*r.* Install edge trimmer cutter unit (par. 89) on left-hand end of upper shaft.

*s.* Slide upper shaft right-hand bearing cap (3) over right-hand end of upper shaft. Position bearing cap on bearing housing. Insert retaining screws and tighten them securely.

*t.* Place belt guard and cutter-grinder shield, attached in position, on right-hand side of edge trimmer housing. Insert retaining screws and tighten securely.

*u.* Install cutter-grinder (par. 89) on right-hand end of upper shaft.

*v.* Replace belt on edge trimmer upper pulley (2).

## Section XV. CUTTER-GRINDING ASSEMBLY

### 115. Description

The cutter-grinding wheel operates on the end of the edge trimmer assembly upper shaft. Operation of the cutter-grinder is controlled by the edge trimmer clutch. The grinder has a universal attachment which permits setting the cutter to required position

for grinding, and an indexing adjustment which controls the uniform grinding of the cutter teeth.

### 116. Adjustment (fig. 157)

Tighten screw (8, fig. 157) so that cutter-grinder post (7) will not swivel on shaft (9). Release thumbscrew (11) and position cutter-grinder as shown in figure 157<sup>2</sup>. Pull post (7) forward so that cutter clears outside edge of wheel about  $\frac{1}{4}$  inch. Lock grinder post shaft (9) with thumbscrew (11). Adjust screw (8) so that cutter is positioned as in figure 157<sup>2</sup> as previously set, but do not permit grinding wheel to snag bottom of cutter-grinder tooth. Set grinder table (5) so that grinding wheel covers full face of tooth to be ground and lock table in position with knurled screw (16).

### 117. Grinder Operation (fig. 157)

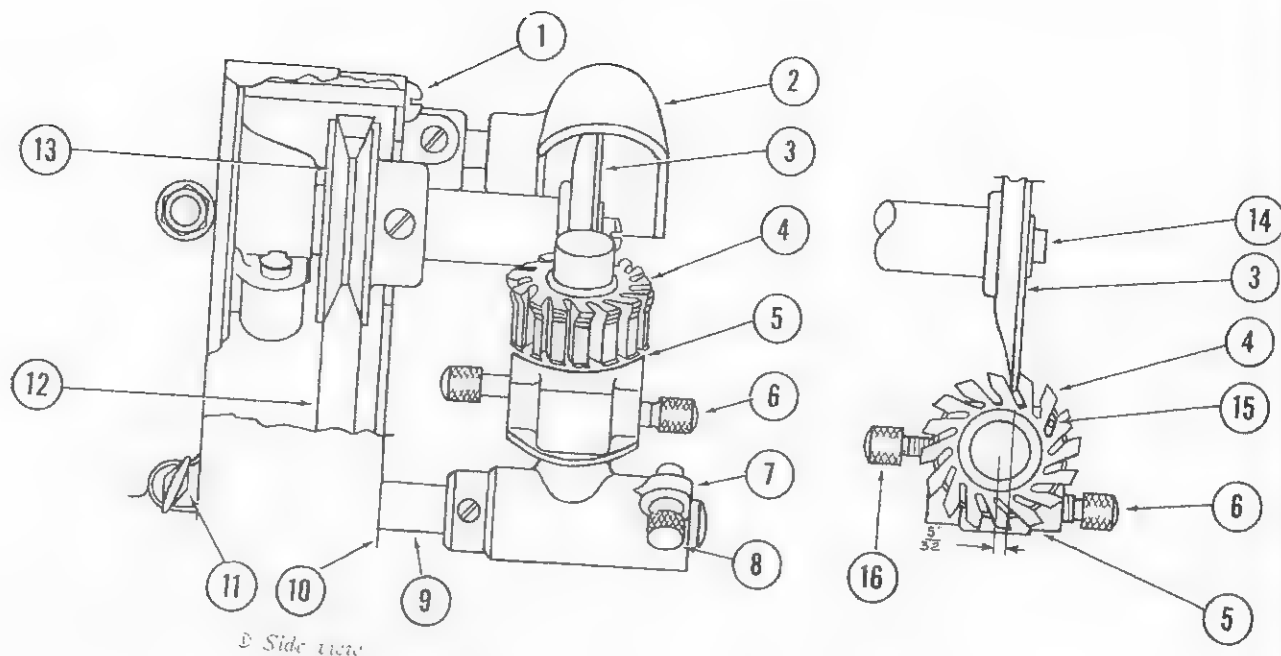
*a. GENERAL.* Cutter teeth must be sharp and uniformly ground if they are to trim shoes properly and quickly. Do not attempt to grind teeth down too quickly because it overheats them, and overheating lessens the temper of the cutter teeth.

*b. PROCEDURE.* The cutter rests on grinder table (5) and is positioned by the locating pin (15). Turn table adjusting screw (6) so that the face of the cutter tooth just touches the side of the grinding wheel. Allow sufficient clearance between cutter tooth space and locating pin (15) to permit a small turning movement of the cutter toward the grinding wheel. This movement of the cutter is necessary so that it can be moved to the grinding wheel and then held against face of wheel as cutter post is moved in and out. This permits taking light cuts and preserves the shape of the grinding wheel. When the cutter is very dull, do not attempt to sharpen it in one setting, but make a complete circuit of the cutter several times. It is unnecessary to change the position of the grinder post fulcrum shaft (9) because the adjusting screw (8) can be used to set the grinder table (5) to suit the cutter and to position the teeth for grinding so their original face angle is retained.

## Section XVI. FINISHER BRUSH ASSEMBLY

### 118. Description

The finisher brush is treated as an assembly (fig.



(a) Side view.

(b) Top view.

Ref. No.	Vendor's part No.	Vendor's nomenclature
1	ET-12A	Belt guard retaining screw.
2		Grinder shield.
3	ET-16	Grinding wheel.
4	ET-17	Edge trimmer cutter.
5	ET-15	Grinder table.
6	ET-15B	Table adjusting screw.
7	ET-14	Grinder post.
8	ET-14F	Grinder post adjusting screw.
9	ET-14A	Grinder post fulcrum shaft.
10	ET-12	Belt guard.
11	ET-14B	Grinder belt fulcrum shaft binding thumbscrew.
12		Heel trimmer driving belt.
13		Heel trimmer driving pulley.
14	ET-16C	Grinding wheel retaining screw.
15	ET-15A	Cutter locating pin.
16	ET-15E	Grinder table binding screw.

Figure 157. Cutter-grinder assembly (American).

158) because the brushing surface and the wheel comprise a single unit. Thus the entire unit must be replaced when the brush is so worn or damaged that it will not perform efficiently.

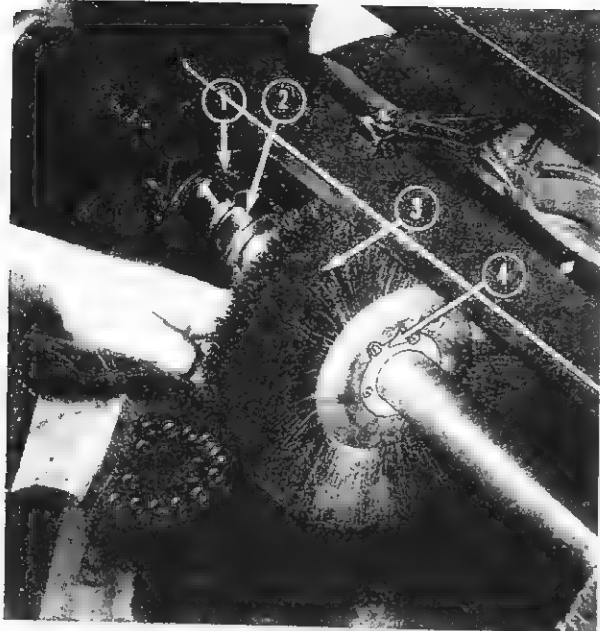
### 119. Removal (fig. 158)

Loosen setscrew (4, fig. 158) on each side of the brush wheel until the wheel turns freely on shaft. Loosen the setscrew in the set collar (2) at each end of brush and burnisher shaft. Slide end of shaft closest to the brush out of the shaft bearing (1). Remove the set collar (2) from the end of the shaft. Remove the brush wheel from the end of the shaft.

### 120. Installation

Place the new brush wheel on the shaft. Replace the set collar (2, fig. 158) on the shaft. Insert the end of the shaft into the bearing. Position the shaft so that the belt between the brush and burnisher shaft and main shaft is aligned with its pulleys. Slide the set collars out to the shaft bearings and tighten the setscrews to hold the brush and burnisher shaft in correct position. Space the brush wheel on the shaft so that it divides the space between the adjacent fixtures on the shaft, and tighten the setscrews (4) in the brush wheel.





Ref. No.	Vendor's part No.	Vendor's nomenclature
1	FB-1	Shaft bearing.
2		Shaft set collar.
3	FW-64	Finishing brush wheel.
4		Finishing brush wheel setscrew.

Figure 158. Finishing brush assembly

## Section XVII. BELTS

### 121. Description

Good belts are essential to the efficient operation of the finishing machine. The ability of the belts to transmit power from power shaft to finishing shafts is directly related to the performance of the finishing wheels on the machine. Leather belts are standard for the finishing machine, but rubber belts may be used when humidity is so high that leather belts would stretch excessively.

### 122. Adjustment

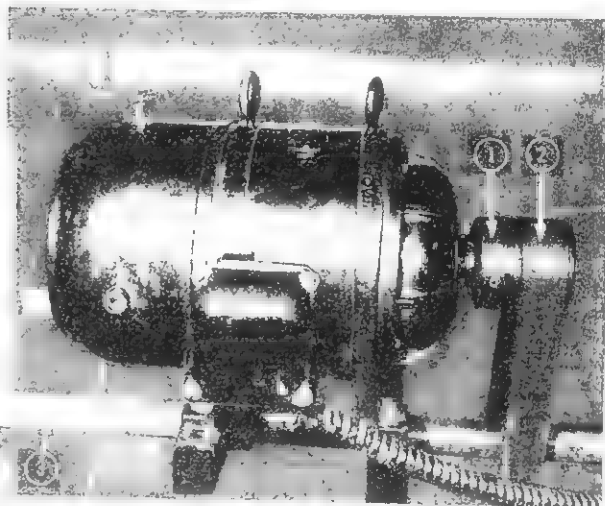
When measuring a leather belt for fitting, be sure to allow for the normal stretch which will occur in the belt after the belt has been run in. In leather belts the stretch usually amounts to  $\frac{1}{8}$  inch for each foot of belt length. For example, if the actual measured distance around the pulleys to be connected is 6 feet, cut the belt  $\frac{6}{8}$  inch less than 6 feet, or 5 feet 11  $\frac{2}{8}$  inches long. Ends of belt should be cut square and, when ends are fastened together, the sides of joined ends must be in line. An improperly fastened belt will creep from one

side of the pulley to the other, and the excessive wear will ruin the belt in a short time. No. 1 stag belt hooks are satisfactory fasteners for leather belts. Points of hooks should go to the pulley side of belt. Whenever leather belts stretch so much that they slip on pulleys, they must be shortened. Be sure that all belts are checked for sufficient tension before loss of motion in the finishing shafts is blamed on clutches (pars. 110 and 111) or motor.

## Section XVIII. MOTOR

### 123. Description

A  $1\frac{1}{2}$ -horsepower, single-phase, 60-cycle, 110- to 220-volt, 1,750-revolutions-per-minute motor is used on the finishing machine.



Ref. No.	Vendor's part No.	Vendor's nomenclature
1		Motor pulley
2	555	Motor belt.
	FC-413	Motor rail.

Figure 159. Motor.

### 124. Installation

Install the motor on the frame provided on the finisher. (See fig. 129.) Make sure that motor pulley is running in the direction which will turn the top of the finishing wheels forward. The motor should be connected to a 220-volt circuit, if possible. If the motor is changed from a 110-volt to a 220-volt circuit, or changed from a 220-volt to a 110-volt circuit, be sure to change wiring connections as shown in the diagram on the inside back cover of the switch box. (See fig. 129.)

## 125. Maintenance

a. Keep motor housing and external parts of motor clean.

b. Lubricate motor according to instructions listed in paragraph 103.

c. For maintenance authorized third and higher echelons, see TM 9-1825A.

## PART FOUR

### AUXILIARY EQUIPMENT

---

The attachments, parts, and subassemblies on the existing machine as it is used by the Army, are integral parts of the machine and are not classified as auxiliary equipment.)

## PART FIVE

### REPAIR INSTRUCTIONS

---

(Because of the simplicity of the design and construction of the finishing machine, repairs made on it are performed with the tools and by mechanics

authorized to the using organization. Therefore, part five does not apply to this machine.)

## BOOK 3

### SOLE CUTTER AND SKIVER MACHINES

American Model C

Landis Model

# PART ONE

## INTRODUCTION

### Section I. GENERAL

#### 126. Scope

The instructions in book 3 apply to the sole cutter and skiver machines, American Model C and the Landis Model. These machines are used to cut and shape the leather soles of shoes.

a. Part two contains operational information for the guidance of personnel responsible for the operation of sole cutter and skiver machines.

b. Part three contains information for the guidance of personnel of using organizations responsible for the first and second echelon maintenance of sole cutter and skiver machines. It contains information needed for the scheduled lubrication and preventive maintenance services.

#### 127. Records

a. WD AGO FORM 460 (PREVENTIVE MAINTENANCE ROSTER). The parts of this form which apply to cutter and skiver machines may be maintained to record the lubrication of this equipment, as described in paragraphs 146 and 147.

b. WD AGO FORM 468 (UNSATISFACTORY EQUIPMENT REPORT). This form will be used to report defects in the manufacturing, design, or operation of machines, assemblies, or parts. It will also be used to report complaints on the lubricants and preserving materials used in the machine. When so

used, the form will contain identifying details of the products and the machinery on which they are used.

#### 128. Orientation

Throughout this book, the terms FRONT, REAR, LEFT, and RIGHT will be used as the operator facing the front of the machine in the operating position would use them.

### Section II. DESCRIPTION AND DATA

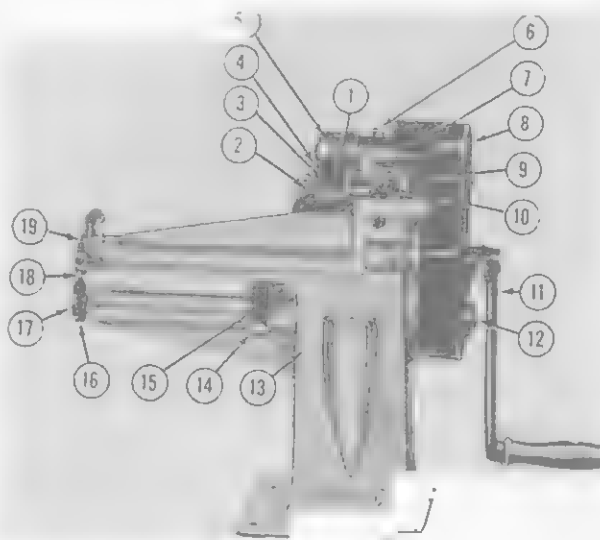
#### 129. General

These machines are table-mounted and hand-

operated. They are simple in design and operation.

#### 130. Identification

The name and the model number of the American machine appear on the front of the stand column of the machine. (See fig. 160.) The name of the Landis sole trimmer (fig. 162) and the name and serial number of the Landis sole skiver and beveler (fig. 161) appear on the front of the stand column of each machine.



Ref  
No.

Nomenclature

1	Skiver knife.
2	Skiver bottom shaft retaining shoe
3	Skiver bottom roll.
4	Skiver knife table.
5	Skiver top roll.
6	Skiver head oil cup.
7	Skiver head.
8	Gear guard.
9	Skiver work gauge.
10	Skiver work gauge washer screw.
11	Hand crank.
12	Sole trimmer feed wheel shaft.
13	Sole trimmer frame.
14	Sole trimmer work gauge thumbscrew.
15	Sole trimmer work gauge.
16	Sole trimmer feed wheel.
17	Sole trimmer work support roll.
18	Sole trimmer blade.
19	Sole trimmer blade guard.

Figure 160. American model C sole cutter and skiver.

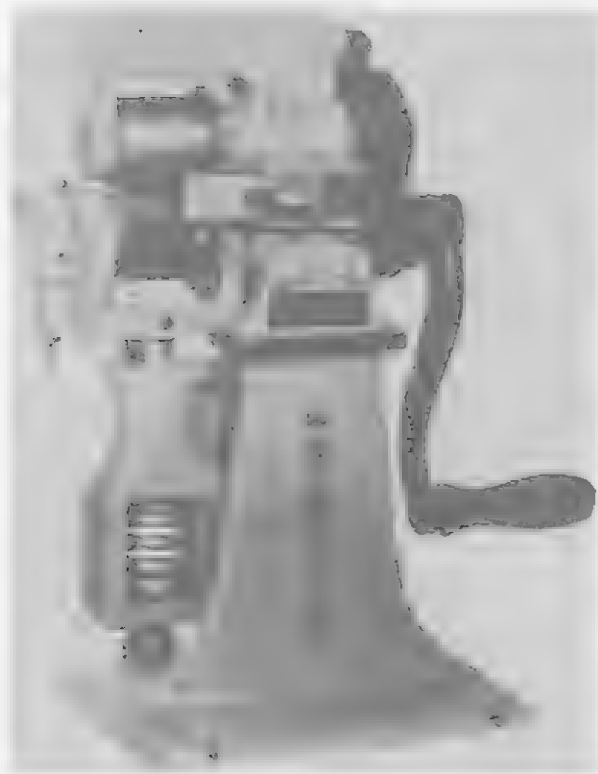


Figure 161. Landis sole skiver and beveler



Figure 162. Landis sole trimmer.

### 131. Differences in Models

*a.* LANDIS SOLE SKIVER AND BEVELER. This machine (fig. 161) is designed to skive (shave down) the hank of the sole and cut a beveled edge around the bottom of the sole.

*b.* LANDIS SOLE TRIMMER. This machine (fig. 162) is used to cut soles from leather strips and to trim applied soles before they are stitched.

*c.* AMERICAN SOLE CUTTER AND SKIVER. This cutter and skiver (fig. 160) performs the combined functions of the machines described in *a* and *b* above. It cuts, bevels and skives the sole, and trims it on the shoe before stitching. Each operation upon the sole is performed similarly, regardless of the machine used. The difference in the models is in the number or kind of operations performed by each machine.

## Section III. TOOLS AND ACCESSORIES

### 132. Tools

These small machines are simple in construction and operate only in conjunction with more complicated shoe repair machinery equipped with tools. Only one tool is issued with the cutting and skiving machines—a single-headed wrench which is used to remove the cutting blades (16 and 18, fig. 160) from the driving shafts. The other machines in the shoe repair unit carry sufficient tools to disassemble the cutter and skiver machines completely.

### 133. Equipment

No equipment or supplies are issued with these machines.

## PART TWO

### OPERATING INSTRUCTIONS

#### Section IV. SERVICE UPON RECEIPT OF EQUIPMENT

##### 134. New Equipment (fig. 160)

*a. INSPECTION FOR DAMAGE IN SHIPMENT.* Check to see that the skiving blade (1, fig. 160) is unbroken and is set in place on its table (4). Check condition of cutting knives. The operating crank will be shipped detached from the machine. Be sure it is included in the shipping package. Check tightness of the retaining screws and nuts.

*b. REMOVAL OF CORROSION-PREVENTIVE MATERIAL.* The working parts of the machine may be covered with grease, heavy oil, or some other corrosion-preventive material when the machine arrives. Remove this material with a brush or cloth soaked in cleaning solvent or Diesel fuel oil. Lubricate the machine according to instructions in paragraphs 146 and 147.

*c. INSTALLATION.* (1) *Assembly.* Place the hand crank (11, fig. 160) on the end of the driving shaft on the right side of the machine and turn the crank until the crank-retaining setscrew is aligned with the flat milled on the driving shaft. Tighten the setscrew securely.

(2) *Location.* In the van type shoe repair trailer, align holes in the base of the stand of the machine with matching holes in the bench on the trailer. Secure the machine with the nuts and bolts provided for installation. In the two-wheel shoe repair trailer, installation consists of removing machines from carrying clamps and placing machines in

clamps on the bed of the trailer. In fixed shoe repair installations, machines will be placed on a bench high enough for them to be in a comfortable operating position. Bore holes in the surface of the bench to correspond with the holes in the base of the stand of the machine and secure with nuts and bolts. If the bench surface is wood, the machine may be secured with lag screws

*d. RUN-IN TEST.* Feed a piece of leather into the cutting knives without forcing it. The cut made

by the knives should be clean and complete. Feed a piece of leather into the skiving blade. Adjust the position of the skiving blade (par. 139) until the skive is clean and the angle of the skive is satisfactory.

##### 135. Used Equipment

Service upon receipt of used equipment is similar to service of new equipment described in paragraph 134.

#### Section V. CONTROLS AND INSTRUMENTS

##### 136. Skiving-Blade Adjustment Screws

*a. HORIZONTAL ADJUSTING SCREWS.* The horizontal adjusting screw is located at the rear of the skiving blade. Turning the screw in forces the skiving blade forward on its table toward the feed rolls, while turning it out moves the blade to the rear away from the rolls.

*b. VERTICAL ADJUSTING SCREWS.* The vertical adjusting screw is located beneath the skiving blade. Turning the screw in and up increases the length of the skive of the sole, while turning it out and down decreases the length of the skive of the sole.

##### 137. Skiver Work Gauge (fig. 160)

The skiver work gauge (9, fig. 160), located on the face of the skiver head (7), guide the sole through the rolls of the skiver. The work gauge is secured to the skiver head with a thumbscrew (10). The work gauge may be moved right or left to deter-

mine the width of the skive or the level of the sole. Moving the work gauge to the left makes the skive narrower while moving it to the right makes it wider.

##### 138. Sole Cutter Work Gauge (fig. 160)

The sole cutter work gauge (15, fig. 160), located between the upper and lower cutter arms of the sole cutter frame (13), is secured to the lower trimmer arm by a thumbscrew (14). The work





No. 1000000000

Bottom skiver roll.  
Top skiver roll.  
Horizontal adjusting screw.  
T-handle binding screw.  
Skiver blade.

Figure 163 Skiver adjustment.

gauge determines the width of the piece to be cut from leather by the cutter blades. Moving the cutter work gauge to the right increases the width of the cut which can be made, while moving it to the left decreases the width of the cut.

## **Section VI. OPERATION UNDER USUAL CONDITIONS**

### **139. Skiving**

a. **SETTING FEED ROLLS.** The top and bottom feed rolls (5 and 3, fig. 160) should be set 3/32 inch apart. They are adjusted to that position by moving the adjusting cap screw going through the fork at the rear of the machine.

b. **SETTING SKIVING KNIFE.** Adjust the horizontal adjusting screw (3, fig. 163) at the rear of the skiving knife to bring the cutting edge of the knife about 1/64 inch short of the forward stop. The inside cutting edge of the knife should clear the skiver top roll (2) about 1/32 inch. The outside cutting edge of the knife should clear the skiver bottom roll (1) about 1/32 inch. This adjustment sets the skiving knife at a slight angle to the rolls. To adjust the angle position of the inside edge of the skiving knife, loosen the T-handle binding screw (4) and turn the eccentric bushing to the proper position. Tighten the cap screw. When the skiving knife (5) has been positioned, tighten the knife-retaining screws.

c. **OPERATION.** Turn the hand crank (11, fig. 160) evenly. Feed leather against the skiver work gauge (9, fig. 160) and between the feeding rolls. Do not force leather against the knife. If the feed rolls and the knife are set properly, the leather will be drawn into the knife smoothly and without jamming. Adjust the position of the skiving knife (5 above) until the angle and the length of the skive are satisfactory.

### **140. Cutting and Trimming**

a. **ADJUSTING SOLE CUTTER WORK GAUGE.** Loosen work gauge thumbscrew. (See 14, fig. 160.) Slide the work gauge (15, fig. 160) on the lower arm until the distance between the work gauge and the sole cutter blade (18, fig. 160) equals the width of the cut which is to be made in the leather. Secure the work gauge thumbscrew.

b. **CUTTING.** Turn hand crank, place the edge of

the leather flat against the work gauge, and start the end of the leather between the cutter blade and the cutter feed wheel. (See 16, fig. 160.)

c. **TRIMMING.** Turn hand crank and guide the sole of the shoe upon the sole cutter work support roll. (See 17, fig. 160.) Trim the sole to the margin desired.

## **Section VII. OPERATION UNDER UNUSUAL CONDITIONS**

### **141. General**

The simple design and the slow operating speed of cutter and skiver machines make them relatively unaffected by most unusual operating conditions which could be tolerated by the operator. However, some precautions should be taken to protect machines from dust and dirt when necessary.

### **142. Operation in Extremely Dusty or Dirty Conditions**

Operating a dirty machine damages it. Remove sand and grit before placing shoes or leather in the cutter and skiver machines. Clean feed rolls, trimming wheel, and exposed gear surfaces daily when operating under extremely dusty or dirty conditions.

## **Section VIII. DEMOLITION TO PREVENT ENEMY USE**

### **143. General**

In a theater of war, where lines are fluid and the tactical situation may change rapidly, it may be necessary to dispose of this equipment quickly so that the enemy may not use it.

### **144. Procedures**

a. **REMOVAL.** If possible, move the machines in the shoe trailer to some safe location outside the threatened area.

b. **DISPOSAL.** If removal is not possible, demolish the machines so thoroughly that nothing in them is useful to the enemy. Use the ax or mattock in the trailer to smash the frame, feed rolls, trimming wheels, driving shafts, driving gears, and the crank of the machine.

## PART THREE

### MAINTENANCE INSTRUCTIONS

---

#### Section IX. SPECIAL ORGANIZATION TOOLS AND EQUIPMENT

##### 145. General

No special organization tools and equipment for sole cutter and skiver machines are issued. Because of their simple design, they may be serviced adequately with tools issued with the other repair machinery used in conjunction with them.

#### Section X. LUBRICATION

##### 146. Lubrication Chart

a. The lubrication chart presented in figure 164 prescribes first and second echelon lubrication maintenance.

b. The service intervals specified in the lubrication chart are for normal operating conditions. Under extreme conditions, such as excessively high or low temperatures, continued operation in sand or dust, immersion in water, or exposure to moisture, these intervals should be reduced. Failure to reduce them may result in malfunctioning or damage to the machines.

c. The lubricants prescribed in the KEY for use on this machine are to be used at all temperatures.

##### 147. Detailed Lubrication Instructions

a. LUBRICATION EQUIPMENT. Each sole cutter and skiver machine is supplied with lubrication equipment adequate to maintain it. Make certain that the lubrication equipment is cleaned both before

and after use. Operate the equipment carefully and

in such manner as to insure a proper distribution of the lubricant.

b. POINTS OF APPLICATION. Oilholes are readily located by reference to the lubrication chart, which is supplemented by individual photographs of the points of lubrication. (See figs. 165 through 168.) Wipe all points and surrounding surfaces clean before applying the lubricant.

c. CLEANING. Use dry-cleaning solvent or Diesel fuel oil to clean or wash all parts. The use of gasoline for this purpose is prohibited. After washing, dry all parts thoroughly before applying lubricant.

d. LUBRICATION NOTES ON INDIVIDUAL UNITS AND PARTS. Every week lubricate the following moving parts with one or two drops of engine oil:

- (1) Feed roll shaft.
- (2) Feed knife shaft.
- (3) Cutter shaft.
- (4) Gears.

#### Section XI. Preventive Maintenance

##### 148. General

Preventive maintenance services are performed by the maintenance personnel of the using organization. These services generally consist of before-, during-, and after-operation services performed by the operator; and the scheduled services (weekly and monthly) performed by organizational maintenance personnel.

##### 149. Operator Maintenance (First Echelon)

a. BEFORE-OPERATION SERVICE. (1) *General*. This inspection schedule is designed primarily as a check to see that the cutter and skiver machines have not been damaged or tampered with since last after-operation service was performed.

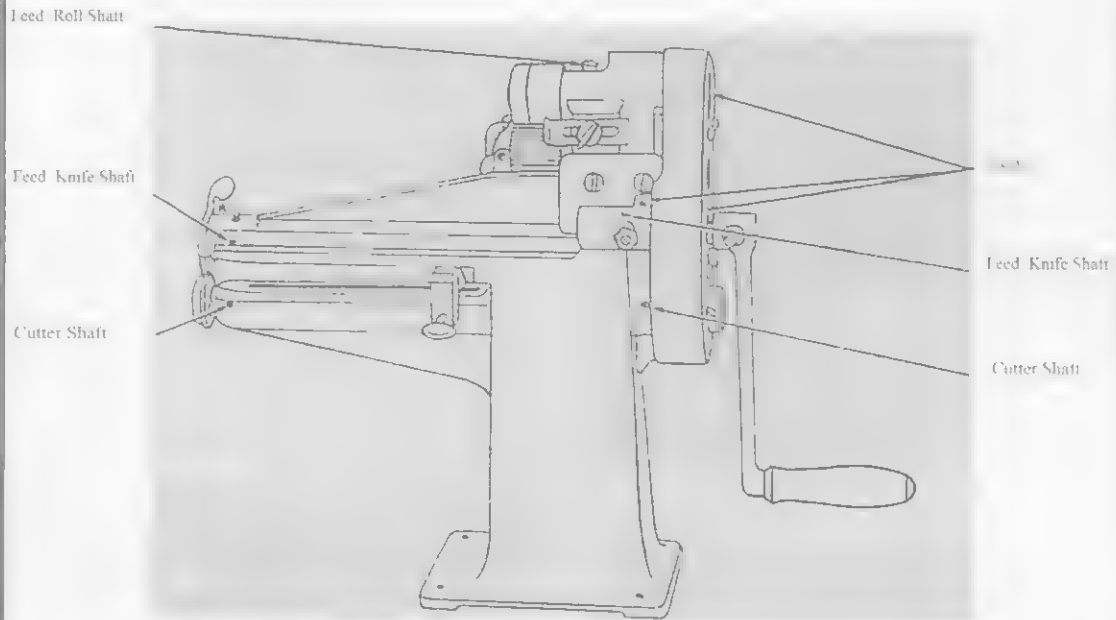
(2) *Procedures*. (a) *Lubrication*. Lubricate according to instructions described in paragraphs 146 and 147.

(b) *Skiver*. Turn hand crank and observe the motion of feed rolls. They should turn easily. See that they are spaced 3/32 inch apart, as they were set. Check position of the skiver knife to see that it is set properly for the type of work to be done.

(c) *Cutter*. Turn hand crank and check action of the cutter blade and the cutter feed wheel. They should be firmly attached to the driving shafts, and the shafts should turn freely.

# LUBRICATION CHART

MACHINE, COMBINATION SOLE CUTTER AND SKIVER  
(AMERICAN "I"-LANDIS)



## -KEY AND NOTE-

LUBRICANT	LOWEST EXPECTED TEMPERATURE	
	Above 32° F.	Below 32° F.
OE-OIL, Engine	OE10	OE10

Every week lubricate those moving parts indicated above with two or three drops of Oil

Figure 164. Lubrication chart



1 shaft bearing-to



b. DURING-OPERATION SERVICE. The only service which must be performed during operation is the adjustment of the skiving blade in case it should be moved out of position or must be adjusted to change the skive of the leather.

c. AFTER-OPERATION SERVICE. Check position of skiver feed rolls. See that the cutter blade is properly aligned with the cutter feed wheel. Check position of skiving blade. Check the cutting edge of skiving blade. If it is dull, report its condition to the unit mechanic so that it may be sharpened according to instructions listed in paragraph 156. If necessary, clean the machine with a cloth or brush soaked with Diesel fuel oil or dry-cleaning solvent.

#### 150. Organization Maintenance (Second Echelon)

a. GENERAL. Regularly scheduled maintenance inspections and services are a preventive maintenance function of the using unit. They are the responsibility of commanders of the operating organizations or installations.

b. FREQUENCY. The intervals between the preventive maintenance services listed here are con-



sidered a minimum requirement for the normal operation of the machine.

c. **FIRST ECHELON PARTICIPATION.** The operator should assist the unit mechanic while second echelon maintenance services are performed on his machine.

d. **PROCEDURES.** (1) *Weekly.* The following maintenance services will be performed weekly:

(a) *Screws and nuts.* Check tightness of all screws and nuts on the machine. If adjusting screws are loose, make sure that they are properly positioned when tightened.

(b) *Skiver.* Turn hand crank and run piece of scrap leather through skiver. Check feeding action of feed rolls. Check condition of cutting edge of skiver blade. If dull, remove blade, sharpen it (par. 156), and replace blade in position.

(c) *Skull cutter.* See that cutter blade and feed wheel are firmly secured to driving shafts. The cutter blade should be positioned between the cutter feed wheel and the cutter work roll. Turn hand crank and feed a piece of leather into the cutting

wheels. The cut should be distinct and the leather should part without feathering.

(2) *Monthly.* No monthly service prescribed.

## Section XII. TROUBLE SHOOTING

### 151. General

This section contains trouble-shooting information which can be helpful in determining the causes of trouble that may develop in the cutter and skiver machine.

### 152. Skiving Difficulties

The principal symptoms of trouble are failure to feed and uneven skiving. Paragraph 153 lists the causes for failure to feed and their remedies. Paragraph 154 lists the causes for uneven skiving and their remedies.

### 153. Causes and Remedies for Failure to Feed

	Remedy
Improper position of feed wheels.	See that feed rolls are securely attached to feed roll drive shafts. Feed rolls should be set 3/32 inch apart. Adjust to that position with adjusting cap screw passing through fork in rear of machine.
Skiver blade set too far forward, jamming leather between feed rolls.	Adjust screw at rear of blade to bring cutting edge of blade forward to within 1/64 inch of forward stop. A blade becomes shorter from sharpening; position of adjusting screw must be changed to bring blade farther forward.

### 154. Causes and Remedies for Uneven Skiving

Possible cause	Remedy
Dull skiver blade.....	Remove skiver blade and sharpen it. (See par. 156.)
Skiver blade set at improper angle to rolls.	Inside cutting edge of blade should clear the top feed roll about 1/32 inch. Outside cutting edge should clear the bottom feed roll a scant 1/32 inch.
Unevenly sharpened skiver blade	Remove blade and sharpen correctly. (See par. 156.)

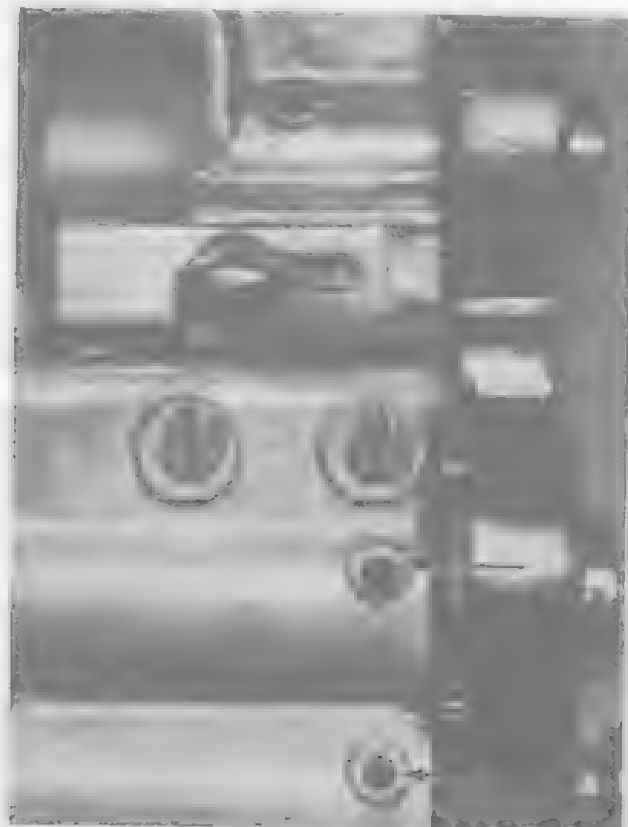


Figure 168. Driving gears

## **Section XIII. SECOND ECHELON MAINTENANCE**

### **155. General**

This section is devoted to the maintenance of cutter and skiver machines which second echelon maintenance units are authorized to perform. The maintenance unit of the using organization may completely disassemble these simple machines. In actual practice, however, complete disassembly of these machines is seldom necessary.

### **156. Sharpening Skiver Blade**

The skiver blade should be stoned on both sides so that the finished cutting edge is in the center of the thickness of the blade. Sharpen the blade on a stone either of a fine grade or of a combination of medium and fine grade. If the blade must be ground down a great deal, initial grinding should be done on a stone of medium grade. Hold the blade slightly in excess of the angle of the existing bevel ground on the stone. Stone first one side, then the other, maintaining proper stoning angle, until the blade has been stoned to a keen slightly "feather" edge. The feather edge may be removed by stoning the blade in a circular motion on a stone of fine grade, or by stropping the blade on leather or wood. The sharpened edge of the skiver blade should be straight and uniformly beveled.

### **157. Replacement of Skiver Feed Rolls (fig. 160)**

*a. REMOVAL.* Remove skiver top roll retaining screw. Remove skiver top roll (5, fig. 160) from the driving shaft. Remove skiver bottom shaft retaining shoe. Loosen retaining screw in skiver bottom roll. (See 3, fig. 160.) Remove skiver

bottom roll from driving shaft.

*b. INSTALLATION.* Place skiver bottom roll (3) on bottom roll driving shaft. Secure retaining screw in skiver bottom roll. Install skiver bottom shaft retaining shoe. Place skiver top roll (5) on top roll driving shaft. Secure skiver top roll retaining screw.

### **158. Replacement of Cutter Blade and Feed Wheel (fig. 160)**

*a. REMOVAL.* Remove retaining screws securing sole cutter work support roll (17, fig. 160) to sole cutter feed wheel (16). Remove cutter work support roll. Remove sole cutter blade guard retaining screw. Remove sole cutter blade guard (19). Place shank wrench on shank of cutter blade between blade and upper cutter arm. Turn top of trimmer blade forward until trimmer is turned off the cutter blade driving shaft. Place shank wrench on shank of sole cutter feed wheel (16) between the cutter feed wheel and the lower cutter arm. Turn the top of the cutter feed wheel to the rear until it is turned off the cutter feed wheel driving shaft.

*b. INSTALLATION.* Place cutter feed wheel (16) on end of cutter feed wheel driving shaft. Use the shank wrench to turn the top of the cutter feed wheel forward until it is secure on the driving shaft. Place the cutter blade (18) on the end of the cutter blade driving shaft. Use the shank wrench to turn the top of the cutter blade to the rear until it is secure on the driving shaft. Put the sole cutter blade guard (19) in place over the sole cutter blade. Secure the blade guard to the upper cutter arm with the blade guard retaining screw. Place the sole cutter work support roll (17) on the sole cutter feed wheel, and secure the work support roll to the feed wheel with work support roll retaining screws.

## PART FOUR

### AUXILIARY EQUIPMENT

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Caterpillar skid steer loaders are designed to use conventional attachments such as buckets, pallet forks, and other implements. The loader is designed to accept

many accessories for auxiliary equipment.



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# Part 2

## Operation, Maintenance & Repair

### Landis Model 25 & 14

### Pilgrim Model 25

### Sole Skiver, Beveler & Trimmer Machines

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### DISCLAIMER

This manual is offered as a guide to shoe makers in the care and maintenance of their equipment. Pilgrim Shoe & Sewing Machine offers no guarantee as to the accuracy of this manual. If you are in doubt of your ability to undertake a repair to your machine, call a professional shoe machine mechanic.

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PART THREE  
SOLE SKIVER AND BEVELER AND TRIMMER MACHINES  
CHAPTER II  
INTRODUCTION

---

Section I. GENERAL

121. Scope

Part three of this manual contains instructions and information on the operation, maintenance, and repair of the sole skiver and beveler and sole trimmer machines designed to cut and shape new leather soles used in shoe repair.

*a. Sole Skiver and Beveler Machine.* These instructions are based on the Landis Model 14 sole skiver and beveler machine (FSN 3520-359-8614) used to skive (shave down) the shank of the sole and also to cut a beveled edge around the bottom of a sole.

*b. Sole Trimmer Machine.* These instructions are based on the Landis Model 25A sole trimmer machine (FSN 3520-359-7598) used to cut soles from leather strips and to trim applied soles before they are stitched.

123. Forms, Records, and Reports

The forms and reports listed in paragraph 3 apply also to the sole skiver and beveler and sole trimmer machines and will be used accordingly.

124. Orientation

Throughout part three, the terms *right*, *left*, *front*, and *rear* indicate directions from the viewpoint of the operator facing the machines and in an operating position.

Section II. DESCRIPTION

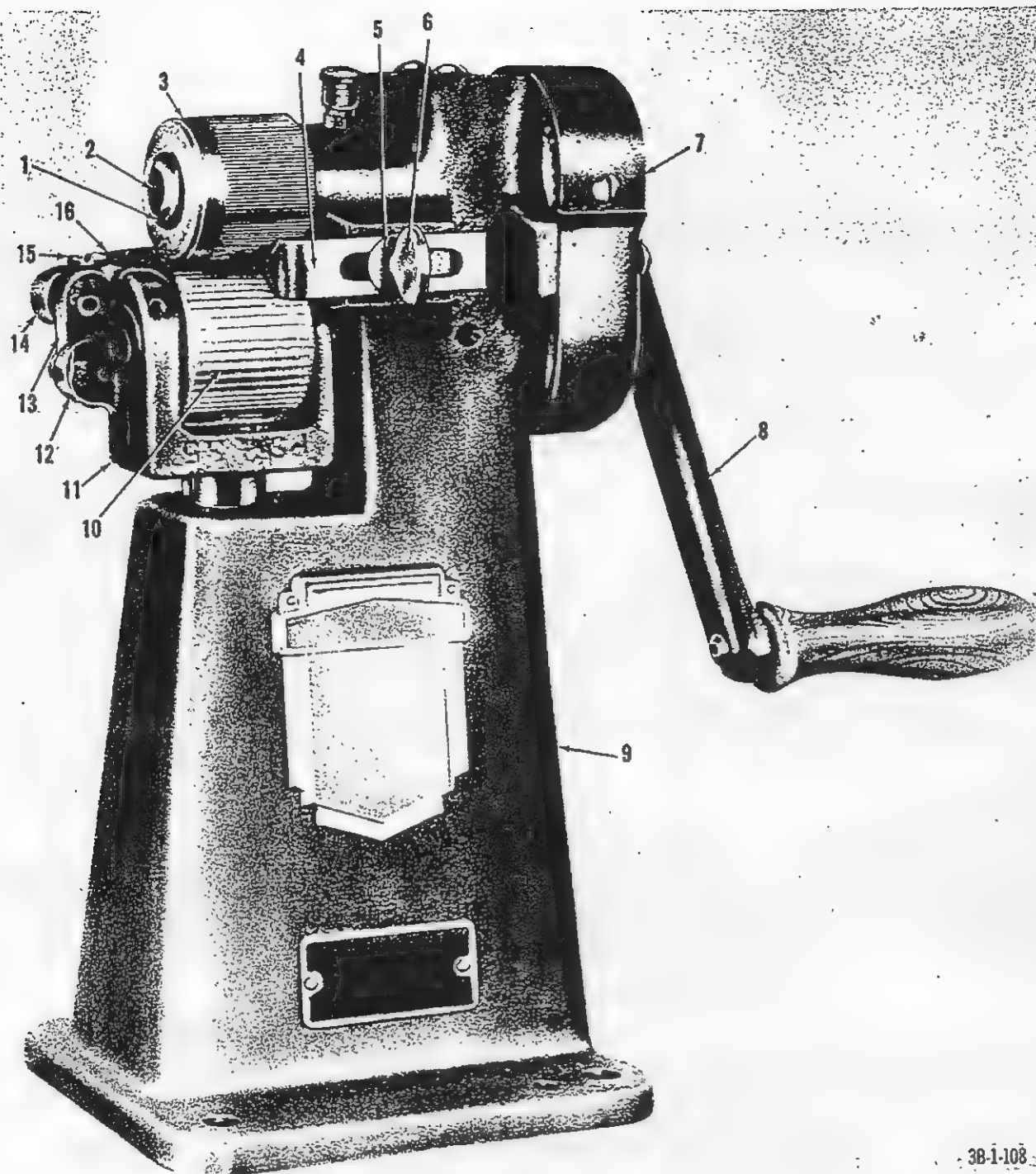
125. Sole Skiver and Beveler

The sole skiver and beveler (fig. 108) is a hand-operated machine, set, for operational purposes, in a bracket on a fender of the trailer. The machine is equipped with two feed rolls and a cutting knife (16). The upper roll (3) and the lower roll (10) hold the leather in place and turn with the action of the handcrank (8) on the roll shafts. As the rolls turn, they feed the leather to the knife, which skives or shaves down the shank or rear portion of a half sole; at the same time, the slant of the knife bevels or tapers the leather

at the proper angle to blend smoothly with the shank of the sole. The top feed roll is smooth at the left end to bevel evenly or thin down the sole at its outer edge in the event it is too heavy for the stitching machine.

126. Sole Trimmer

The sole trimmer (fig. 109) is a hand-operated machine. For operational purposes, it is set in a bracket on a fender of the trailer. The sole trimmer is equipped with a cutting blade (1), a work support roll (12), and a feed wheel (11) attached to two shafts turned by a handcrank (9). As the shafts turn, the

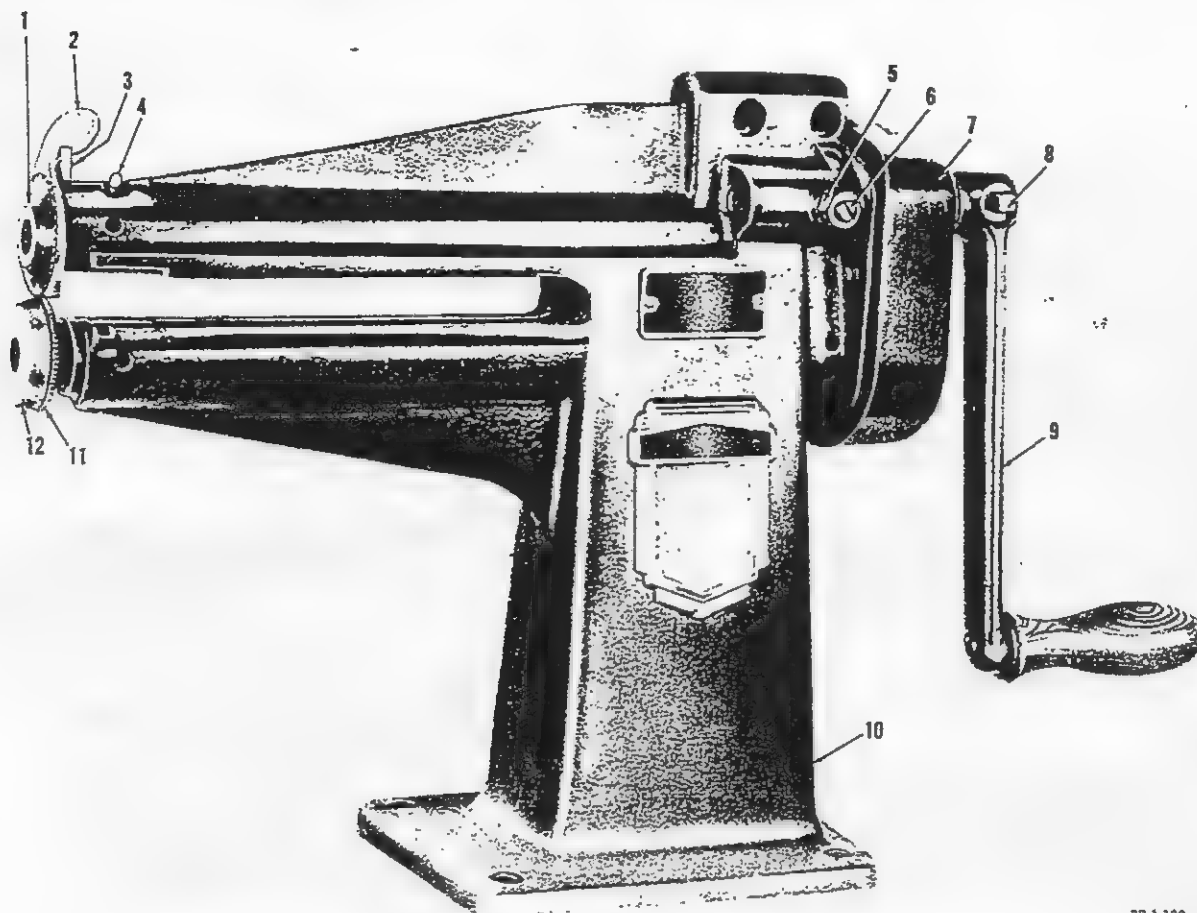


- |                                     |                               |
|-------------------------------------|-------------------------------|
| 1 Upper roll retaining screw washer | 9 Base                        |
| 2 Upper roll retaining screw        | 10 Lower roll                 |
| 3 Upper roll                        | 11 Fork                       |
| 4 Work gage                         | 12 Knife table link eccentric |
| 5 Work gage screw washer            | 13 Knife table link           |
| 6 Work gage screw                   | 14 Knife table                |
| 7 Gear guard                        | 15 Knife fastening screw      |
| 8 Crank assembly                    | 16 Knife                      |

Figure 108. Sole skiver and beveler.

leather, guided by the operator, moves between the feed wheel and the cutting blade. The blade guard (2) may be raised or lowered, de-

pending upon whether a broad strip of leather is to be cut or excess material is to be trimmed from the edge of the shoe before stitching.



3B-1-109

- |   |                                  |    |                         |
|---|----------------------------------|----|-------------------------|
| 1 | Cutting blade                    | 7  | Gear guard              |
| 2 | Blade guard                      | 8  | Crank assembly setscrew |
| 3 | Blade guard spring post          | 9  | Crank assembly          |
| 4 | Blade guard latch plunger handle | 10 | Base                    |
| 5 | Handcrank setscrew nut           | 11 | Feed wheel              |
| 6 | Handcrank setscrew               | 12 | Work support roll       |

Figure 109. Sole trimmer.

## CHAPTER 12

### OPERATING INSTRUCTIONS

#### Section I. SERVICE UPON RECEIPT OF EQUIPMENT

##### 127. Cleaning

Remove rust-preventive compound from all nuts, bolts, and unpainted surfaces on the sole skiver and beveler and trimmer machines and clean all parts thoroughly with SD.

##### 128. Inspection

a. Inspect both machines thoroughly for proper assembly, tightness, and cleanliness. Check feed rolls and knife of sole skiver and

beveler for good condition. Check cutting blade, feed wheel, and work support roll of sole trimmer for good condition.

b. Correct all deficiencies as indicated in paragraph 18.

##### 129. Lubrication

Lubricate sole skiver and beveler and sole trimmer machines as indicated in paragraphs 138 and 139.

#### Section II. OPERATIONAL ADJUSTMENTS

##### 130. General

Adjustments described in paragraphs 131 through 134 will be made as required in before-, during-, and after-operation services. These adjustments apply only to the sole skiver and beveler. There are no adjustments for the sole trimmer.

##### 131. Setting Forward Position of Knife

A fork shoulder (3, fig. 110) on the sole skiver and beveler provides a forward location for the knife (4) and prevents the knife from jamming the feed rolls (3 and 10, fig. 108). Set knife slightly away from fork shoulder as follows:

a. Loosen 2 knife locking screws (2, fig. 110) so blade will slide easily.

b. Hold knife against shoulder and turn knife adjusting screw (7) until the head just touches knife.

c. Back off screw one-eighth turn and hold knife back firmly against screw while tightening knife locking screws.

##### 132. Setting Angle of Knife

The knife (4, fig. 110) must be set at an angle with the blade clearing both upper and lower

feed rolls (3 and 10, fig. 108) to cut properly and give correct bevel or slope to butt end of half sole. For Army footwear, the inside edge of the knife near the column should clear the upper roll by 1/32 inch and the outside edge should clear the lower roll by 1/32 inch. Set angle of knife as follows:

###### a. Adjusting Inside Edge.

(1) Loosen T-handle binding screw (1, fig. 110).

(2) Turn knife table long eccentric by indicator pin (10) until pin is in the position shown in figure 110.

(3) Tighten binding screw.

###### b. Adjusting Outside Edge.

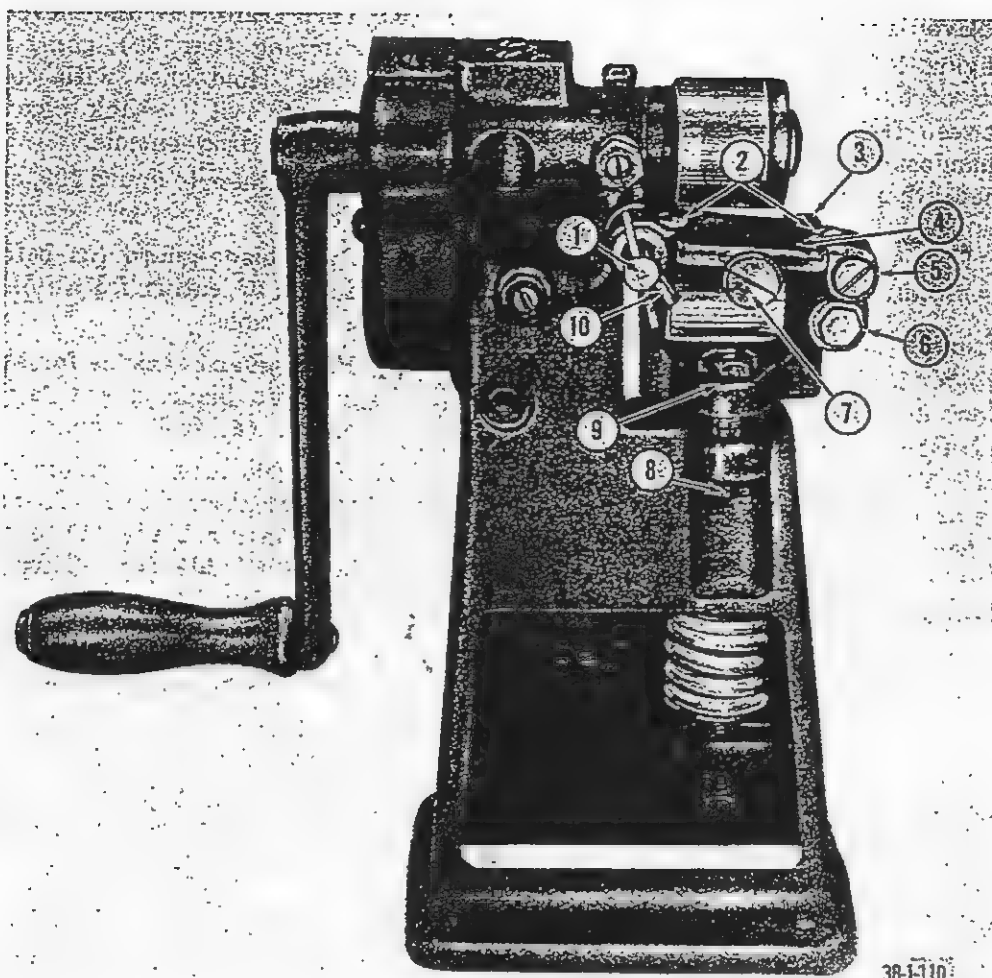
(1) Loosen table link short eccentric screw (5).

(2) Turn table link short eccentric (6) until clearance indicated above is reached.

(3) Tighten eccentric screw.

##### 133. Setting Feed Rolls

Upper and lower feed rolls (3 and 10, fig. 108) must be set close together to hold and feed leather to the knife. The lower roll should be set from 3/32 inch to 1/8 inch below the



38-1-110

- |   |   |
|---|---|
| 1 Knife table long eccentric T-handle binding screw | 6 Table link short eccentric                |
| 2 Knife locking screws                              | 7 Knife adjusting screw                     |
| 3 Fork shoulder                                     | 8 Fork adjusting screw                      |
| 4 Knife   | 9 Fork adjusting screw locknut              |
| 5 Table link short eccentric screw                  | 10 Knife table long eccentric indicator pin |

Figure 110. Sole skiver and beveler adjustments.

upper roll. Adjust lower roll as follows:

a. Loosen fork adjusting screw locknut (9, fig. 110).

b. Turn fork adjusting screw (8) until the proper distance is reached.

c. Tighten locknut.

### 134. Setting Work Gage

Set work gage (4, fig. 108) so knife (16) will cut a  $\frac{3}{4}$ -inch skive as follows:

a. Loosen work gage screw (6).

b. Slide gage to required position.

c. Tighten screw.

## Section III. OPERATION

### 135. General

Operation of the sole skiver and beveler and the trimmer machines will normally be the same under usual and unusual conditions. Their simple designs and slow operating speeds

make these machines relatively unaffected by unusual operating conditions if proper lubrication (pars. 138 and 139) and preventive maintenance services (pars. 141 through 143) are performed.

### 136. Sole Skiver and Beveler

Refer to figure 108, and proceed as follows:

a. Set butt of half sole against work gage (4) and between feed rolls (3 and 10).

b. Turn handcrank (8), and guide, but do not force, the leather as it is pulled by the rolls against the knife (16).

c. Allow leather to clear rolls before removing from knife table (14).

### 137. Sole Trimmer

a. *Trimming.* Refer to figure 109, and proceed as follows to trim excess material from edge of sole before stitching:

(1) Raise blade guard (2) and insert outsole as far as needed, resting outsole on work support roll (12) and feed wheel (11).

(2) Allow guard to rest on outsole.

(3) Turn crank (9) and move shoe as in stitching (par. 30), going around the shoe. Hold shoe with bottom level except at shank to prevent undercutting outsole.

b. *Cutting.* Refer to figure 109, and proceed as follows:

(1) Raise blade guard (2) before cutting a strip of leather for a full sole or for a half sole.

(2) Press guard back as far as it will go and set blade guard latch plunger handle (4) to lock guard.

(3) Mark position of cut on leather and insert leather between feed wheel (11) and cutting blade (1) until mark is beneath blade (4). Turn crank and cut leather.



## CHAPTER 13

### ORGANIZATIONAL MAINTENANCE

---

#### Section I. LUBRICATION

##### 138. Lubrication Charts

a. Lubrication charts for the sole skiver and beveler (fig. 111) and sole trimmer (fig. 112) prescribe lubrication points, intervals, procedures, and lubricants for these machines.

b. Intervals specified in the lubrication charts are for normal operating conditions and continuous use of equipment. Time between intervals should be reduced under extreme temperature conditions or prolonged periods of

operation in sandy or dusty areas. Time between intervals may be extended when equipment is not in continuous service.

##### 139. Specific Instructions

a. Lubrication fittings and oilholes can be located by reference to the lubrication charts.

b. Wipe lubrication points and surrounding surfaces clean before applying lubricant. Clean all parts with SD and let parts dry thoroughly before applying lubricant.

#### Section II. PREVENTIVE MAINTENANCE

##### 140. Responsibility

The preventive maintenance services are a function of the using organization. These services consist of before-, during-, and after-operation services.

##### 141. Before-Operation Service

###### a. Sole Skiver and Beveler.

- (1) Make sure machine has not been tampered with or damaged since last operation.
- (2) Turn crank and observe for proper gear mesh and easy turning of feed rolls on their shafts.
- (3) Check for proper setting of rolls and knife.
- (4) Make sure knife blade is sharp enough.
- (5) Lubricate machine (pars. 138 and 139).
- (6) Report any unsatisfactory condition that cannot be corrected.

###### b. Sole Trimmer.

- (1) Make sure machine has not been tampered with or damaged since last operation.

- (2) Turn crank and observe for proper gear mesh and proper turning of cutting blade and feed wheel on their shafts.

- (3) Make sure cutting blade, feed wheel, and work support roll are properly attached to shafts and that cutting blade is sharp enough.

- (4) Check blade guard latch plunger handle for proper operation.

- (5) Lubricate machine (pars. 138 and 139).

- (6) Report any unsatisfactory condition that cannot be corrected.

##### 142. During-Operation Service

a. *Sole Skiver and Beveler.* Observe action of machine to make sure rolls feed properly and that knife is cutting proper skive sharply and cleanly.

b. *Sole Trimmer.* Observe action of machine to make sure it is feeding properly, that cutting blade is cutting cleanly and sharply, and cutter guard is holding its position.

# LUBRICATION CHART

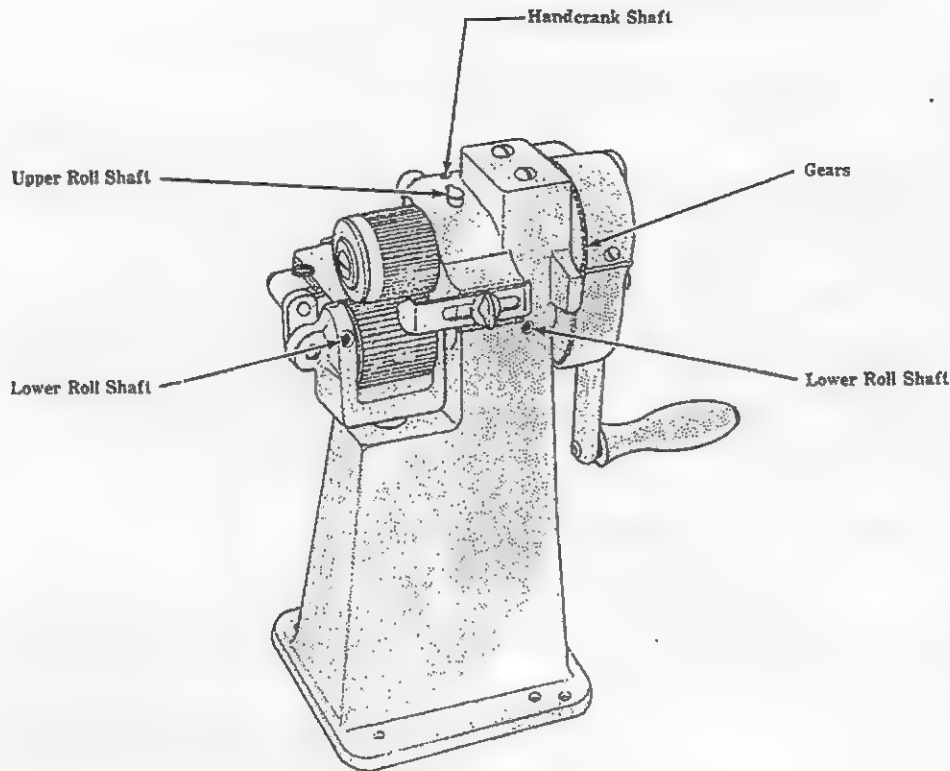
## SOLE SKIVER AND BEVELER (LANDIS MODEL 14)

Intervals given are maximums for normal operation. For abnormal conditions or activities, intervals should be shortened to compensate. Extend when not in use.

Clean all parts with Solvent, dry-cleaning (SD).

Dry before lubricating.

For intervals and lubricants refer to KEY.



—KEY—

LUBRICANT	ALL TEMPERATURES	INTERVALS
OE—Lubricating Oil, Internal Combustion Engine	OE-10	Daily

3B-1-111

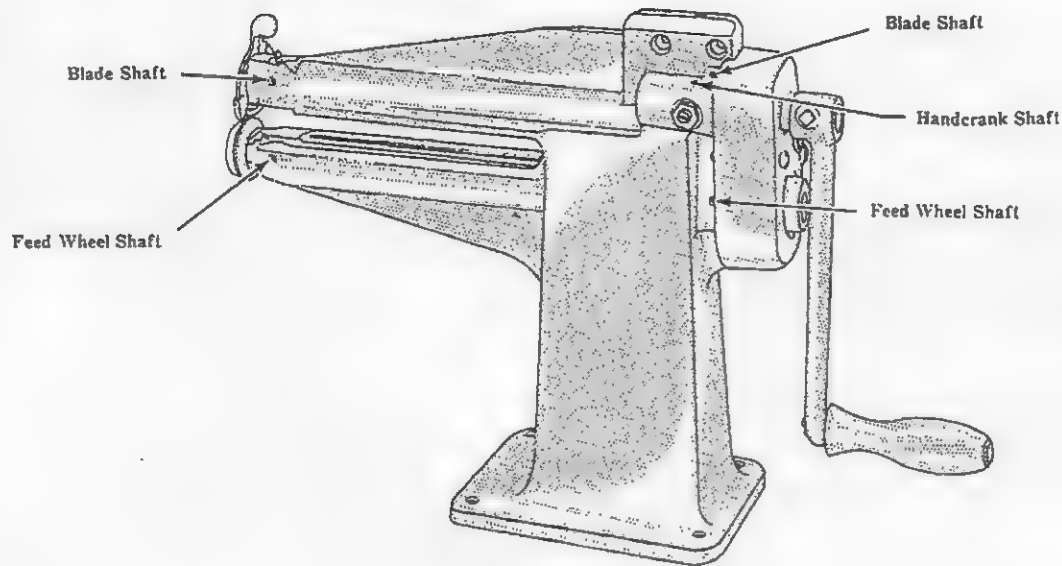
Figure 111. Lubrication chart, sole skiver and beveler.

# LUBRICATION CHART

## SOLE TRIMMER AND CUTTER (LANDIS MODEL 25A)

Intervals given are maximums for normal operation. For abnormal conditions or activities, intervals should be shortened to compensate. Extend when not in use.

Clean all parts with Solvent, dry-cleaning (SD).  
Dry before lubricating.  
For intervals and lubricants refer to KEY.



—KEY—

LUBRICANT	ALL TEMPERATURES	INTERVALS
OE—Lubricating Oil, Internal Combustion Engine	OE-10	Weekly

38-1-112

Figure 112. Lubrication chart, sole trimmer.

### 143. After-Operation Service

#### a. Sole Skiver and Beveler.

- (1) Check condition of knife, and sharpen if necessary.
- (2) Make any necessary adjustments of positions of knife or feed rolls.
- (3) Lubricate as required.
- (4) Clean machine with a cloth and SD.
- (5) Report any deficiencies that cannot be corrected.

#### b. Sole Trimmer.

- (1) Check condition of cutting blade, and install new one if necessary.
- (2) Make sure that cutting blade, feed wheel, and work support roll are properly attached to their shafts.
- (3) Clean all parts with a cloth and SD.
- (4) Lubricate as required.
- (5) Report any deficiencies that cannot be corrected.

## Section III. TROUBLESHOOTING

### 144. General

Troubleshooting information is designed to help organizational personnel quickly locate and correct any troubles that may develop during operation.

### 145. Troubleshooting Chart

Some of the more common troubles that may develop in the sole skiver and beveler and sole trimmer machines, their possible causes, and suggested remedies are listed in table III.

Table III. Troubleshooting Chart, Sole Skiver and Beveler and Sole Trimmer

Trouble	Cause	Remedy
Sole skiver and beveler:		
Failure to feed.	Feed rolls too close or too far apart. Blade too far forward, jamming leather between feed rolls.	Set feed rolls (par. 133). Blade improperly set, knife should be set slightly behind fork

Table III—Continued

Trouble	Cause	Remedy
Uneven skiving.	Dull or unevenly sharpened skiver knife. Knife set at improper angle. Knife too far from rolls.	shoulder (par. 131). Remove and sharpen knife. Set knife to proper angle (par. 132). Set knife slightly behind fork shoulder; as knife becomes shorter from sharpening, move knife forward.
Sole trimmer: Improper feeding.	Cutting blade, work support roll, and feed wheel loose on shafts Serrated edge of cutting blade and teeth of feed wheel dull or broken.	Tighten and set properly. Install new parts.
Failure to cut or trim properly.	Dull cutting blade.	Sharpen cutting blade.

## Section IV. UNIT MAINTENANCE

### 146. Responsibility

Services in paragraphs 147 and 148 are the responsibility of the using organization in addition to those adjustments noted as a responsibility of the operator (pars. 131-134). Services and repairs beyond those detailed to the operator or unit mechanic should be reported for referral to higher echelon maintenance.

### 147. Skiver Knife

a. Removal and Installation. Refer to figure 110, and proceed as follows:

- (1) Loosen locking screws (2) and adjusting screw (7) enough to slide knife (4) from table.
  - (2) Reverse procedure in step (1) above to install knife.
  - (3) Adjust knife (pars. 131 and 132) before tightening locking screws.
- b. Sharpening.
- (1) Regrind very blunt knife before knife is stoned.
  - (2) Grind knife on both sides so finished cutting edge is in center of thickness of blade.

- (3) Use fine grade grinding stone or one of combination medium and fine grades.
- (4) When much grinding is required, perform initial grinding on medium grade stone.
- (5) When grinding is complete, stone knife on top side only, holding blade slightly in excess of angle of existing bevel (aprx. 10° from centerline of knife).
- (6) Stone knife to feathered edge that is straight and uniformly beveled.
- (7) Remove feather edge by stoning knife in circular motion on fine grade stone

or by stropping knife on leather or wood.

#### 148. Trimmer Cutting Blade

- a. Remove blade by backing off in same direction blade turns when cutting; blade turns clockwise and is backed off clockwise.
- b. Use punch to loosen blades by inserting punch in hub.
- c. Install blade by screwing blade on shaft.
- d. The blade is serrated to aid in feeding, and blade must be sharp for good results.
- e. Sharpen blade by holding sharpening stone on beveled side of blade at approximately same angle while turning handcrank.
- f. Remove wire edge on flat side of blade.

## CHAPTER 14

### FIELD AND DEPOT MAINTENANCE

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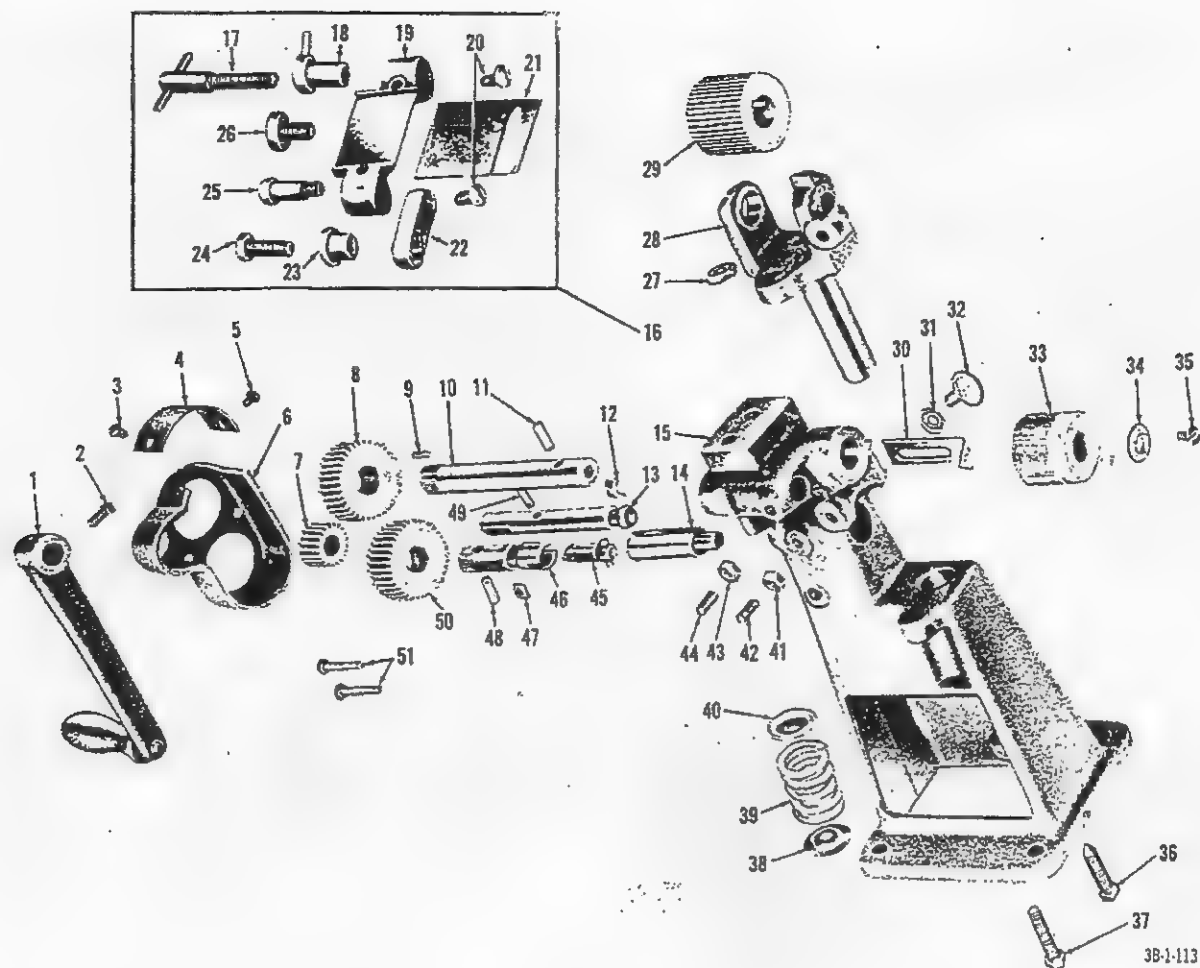
#### 149. General

Instructions for complete disassembly of the sole skiver and beveler and sole trimmer are contained in paragraphs 150 and 151. When inspection indicates that only such components as the crank assembly or knife assembly need replacement or repair, simplicity of design allows for removal without special instructions.

#### 150. Sole Skiver and Beveler

*a. Disassembly.* Refer to figure 113, and proceed as follows:

- (1) Remove setscrew (2) from handcrank assembly (1), and remove handcrank assembly from end of handcrank shaft (13).
- (2) Remove 2 screws (51) from housing (15), and remove gear guard (6) from housing.
- (3) Take out 2 screws (3 and 5) from gear guard, and remove cover plate (4) from gear guard.
- (4) Remove handcrank shaft retaining screw locknut (43) from retaining screw (44), and remove retaining screw from housing.
- (5) Slide handcrank shaft from housing, and remove shaft retaining shoe (12) from shaft.
- (6) Tap handcrank shaft pinion gear (7) off of shaft, and remove shaft pinion gear pin type key (49) from hole in shaft.
- (7) Take out upper roll retaining screw (35) from end of upper roll shaft (10), remove retaining screw washer (34), tap upper roll (33) from shaft, remove upper roll key (11) from hole in shaft, and slide shaft (10) from housing.
- (8) Tap upper roll gear (8) from upper roll shaft, and remove shaft gear pin type key (9) from groove in shaft.
- (9) Remove knife table long eccentric binding screw (17) from housing, and remove long eccentric assembly (18) from knife table (19).
- (10) Unscrew knife table link eccentric binding screw (24) from housing, remove link eccentric (23) from knife table link (22), remove knife table connecting screw (25) from knife table link, and remove knife table link.
- (11) Remove knife adjusting screw (26) from knife table, slide knife (21) from knife table, and unscrew 2 knife fastening screws (20) from knife table.
- (12) Remove from housing the fork pressure spring adjusting screw (36), spring cup washer (40), fork pressure spring (39), and spring cup washer (38).
- (13) Unscrew fork adjusting screw locknut (27) from fork adjusting screw (37), and remove fork adjusting screw from fork (28).
- (14) Remove lower gear shaft retaining shoe screw locknut (41) from shoe screw (42), and remove shoe screw from housing.
- (15) Remove lower gear shaft (46) from housing, remove shaft retaining shoe (47) from shaft, tap lower gear (50) from shaft, and remove lower gear assembly key (48) from hole in shaft.
- (16) Slide lower roll shaft driving link (45) from opening in housing.
- (17) Use brass drift to punch lower roll



- |   |  |
|---|--|
| 1 Handcrank assembly with handle            | 27 Fork adjusting screw locknut                  |
| 2 Setscrew                                  | 28 Fork  |
| 3 Screw                                     | 29 Lower roll with key                           |
| 4 Cover plate                               | 30 Work gage                                     |
| 5 Screw                                     | 31 Work gage screw washer                        |
| 6 Gear guard                                | 32 Work gage screw                               |
| 7 Handcrank shaft pinion gear               | 33 Upper roll                                    |
| 8 Upper roll gear                           | 34 Upper roll retaining screw washer             |
| 9 Upper roll shaft gear pin type key        | 35 Upper roll retaining screw                    |
| 10 Upper roll shaft                         | 36 Fork pressure spring adjusting screw          |
| 11 Upper roll key                           | 37 Fork adjusting screw                          |
| 12 Handcrank shaft retaining shoe           | 38 Fork pressure spring cup washer               |
| 13 Handcrank shaft                          | 39 Fork pressure spring                          |
| 14 Lower roll shaft                         | 40 Fork pressure spring cup washer               |
| 15 Housing                                  | 41 Lower gear shaft retaining shoe screw locknut |
| 16 Knife table assembly                     | 42 Lower gear shaft retaining shoe screw         |
| 17 Knife table long eccentric binding screw | 43 Handcrank shaft retaining screw locknut       |
| 18 Knife table long eccentric assembly      | 44 Handcrank shaft retaining screw               |
| 19 Knife table                              | 45 Lower roll shaft driving link                 |
| 20 Knife fastening screws                   | 46 Lower gear shaft                              |
| 21 Knife                                    | 47 Lower gear shaft retaining shoe               |
| 22 Knife table link                         | 48 Lower gear assembly key                       |
| 23 Knife table link eccentric               | 49 Handcrank shaft pinion gear pin type key      |
| 24 Knife table link eccentric binding screw | 50 Lower gear assembly                           |
| 25 Knife table connecting screw             | 51 Screws  |
| 26 Knife adjusting screw                    |  |

Figure 113. Sole skiver and beveler, exploded view.

shaft (14) back through housing, and remove lower roll with key (29) from fork.

(18) Remove lower roll shaft from housing.

(19) Turn fork counterclockwise, and lift from housing.

(20) Remove work gage screw (32), washer (31), and work gage (30) from housing.

*b. Reassembly.* Reverse procedure in *a* above.

## 151. Sole Trimmer

*a. Disassembly.* Refer to figure 114, and proceed as follows:

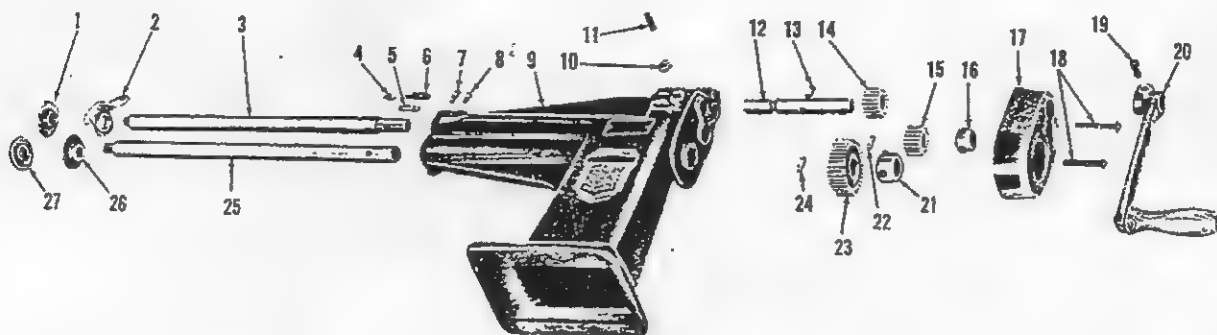
from housing, and slide handcrank shaft from housing.

(4) Tap handcrank shaft pinion gear (14) from end of shaft, and remove handcrank shaft pinion gear pin type key (13) from hole in shaft.

(5) Loosen 2 setscrews in blade shaft pinion collar assembly (16), and remove collar from end of blade shaft (3).

(6) Tap blade shaft pinion gear (15) off end of blade shaft, and remove blade shaft pinion gear pin type key (22) from hole in shaft.

(7) Loosen 2 setscrews in feed wheel



3B-1-114

- 1 Blade
- 2 Blade guard
- 3 Blade shaft
- 4 Blade guard stop pin
- 5 Blade guard latch plunger
- 6 Blade guard spring
- 7 Blade guard spring post
- 8 Blade guard latch plunger handle
- 9 Housing
- 10 Handcrank shaft screw nut
- 11 Handcrank shaft screw
- 12 Handcrank shaft
- 13 Handcrank shaft pinion gear pin type key
- 14 Handcrank shaft pinion gear

- 15 Blade shaft pinion gear
- 16 Blade shaft pinion collar assembly with setscrews
- 17 Gear guard
- 18 Gear guard screws
- 19 Crank assembly setscrew
- 20 Crank assembly with handle
- 21 Feed wheel shaft gear collar assembly with setscrews
- 22 Blade shaft pinion gear pin type key
- 23 Feed wheel shaft gear
- 24 Feed wheel shaft gear pin type key
- 25 Feed wheel shaft
- 26 Feed wheel
- 27 Work support roll

Figure 114. Sole trimmer, exploded view.

(1) Remove crank assembly setscrew (19) from crank assembly (20), and remove crank assembly from end of handcrank shaft (12).

(2) Take out 2 gear guard screws (18) holding gear guard to housing (9), and remove gear guard (17).

(3) Remove handcrank shaft screw nut (10) from screw (11), remove screw

shaft gear collar assembly (21), and remove collar from end of feed wheel shaft (25).

(8) Tap feed wheel shaft gear (23) from end of feed wheel shaft, and remove feed wheel shaft gear pin type key (24) from hole in shaft.

(9) Unscrew work support roll (27) from end of feed wheel shaft.



- (10) Remove blade guard spring (6) from blade guard stop pin (4) and from blade guard spring post (7).
- (11) Unscrew blade (1) from blade shaft, and slide blade guard (2) off end of shaft.
- (12) Unscrew feed wheel (26) from feed wheel shaft.
- (13) Remove blade guard spring post from top of housing.

- (14) Remove blade guard latch plunger handle (8) from hole in latch plunger (5) and from housing, and remove latch plunger from housing.

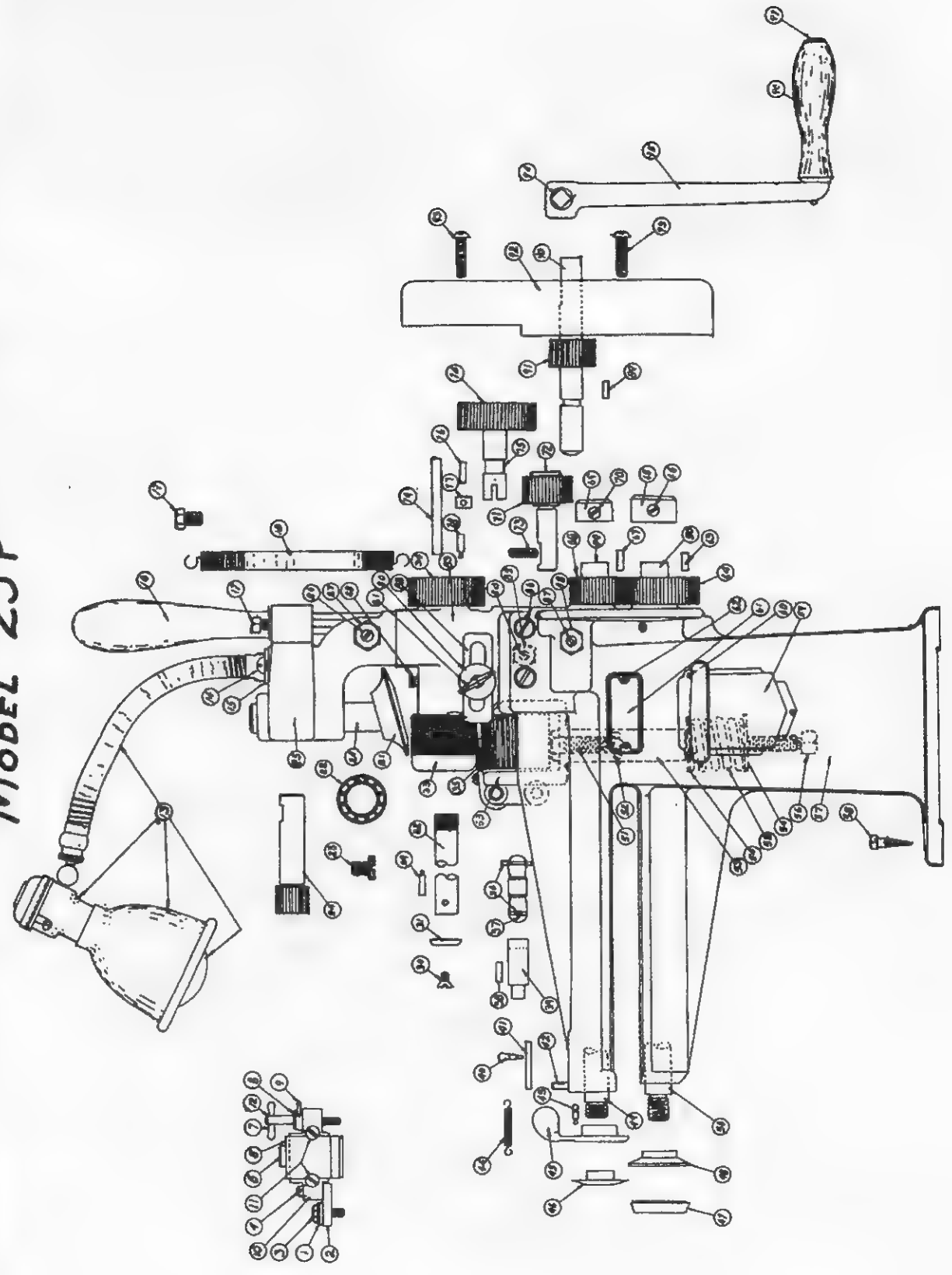
- (15) Tap blade guard stop pin from blade guard.

- (16) Slide blade shaft and feed wheel shaft out of housing.

*b. Reassembly.* Reverse procedure in *a* above.

PILGRIM SHOE & SEWING MACHINE CO., Inc.

Model "25 P"



REF. NO.	TITLE	PART NO.	QTY.	REF. NO.	TITLE	PART NO.
1.	KNIFE TABLE LINK ECCENTRIC	CSW-20X	1	49.	SOLE CURTAIN BLADE SHARP	CSW-2
2.	KNIFE TABLE LINK	CSW-20W	1	50.	SOLE CURTAIN FEED WHEEL SHARP	CSW-2
3.	KNIFE TABLE LINK ECCENTRIC SCREW	CSW-20L	1	51.	SHIVER FEED ADJUSTING SCREW	CSW-3
4.	KNIFE TABLE LINK SCREW	CSW-20U	1	52.	SHIVER FEED ADJUSTING SCREW NUT	CSW-19A
5.	SHIVER KNIFE	CSW-20E	1	53.	SHIVER FEED	CSW-19B
6.	KNIFE ADJUSTMENT SCREW	CSW-20G	1	54.	SHIVER FEED PRESSURE SCREW CAP WRENCH	CSW-19
7.	KNIFE TABLE LONG ECCENTRIC SCREW PIN	CSW-20D	1	55.	SHIVER FEED PRESSURE SPRING	CSW-19D
8.	KNIFE TABLE LONG ECCENTRIC	CSW-20H	1	56.	SHIVER FEED PRESSURE SPRING SCREW	CSW-19G
9.	KNIFE TABLE LONG ECCENTRIC PIN	CSW-20B	1	57.	CANISTER CURTAIN SHIVER, TAILORER, & WELT ROLLER FRAME	CSW-19E
10.	KNIFE TABLE	CSW-20	1	58.	FRAME IS BARREN FASTENING SCREW	CSW-1
11.	KNIFE FASTENING SCREW	CSW-20F	2	59.	WHEEL PAIR	CSW-1A
12.	KNIFE TABLE LONG ECCENTRIC SCREW	CSW-20C	1	60.	WHEEL PAIR FASTENING SCREWS	CSW-1B
13.	LAMP	CSW-30	1	61.	SERIAL NUMBER PLATE	CSW-3A
14.	SWITCH, CONDUIT, & WIRE ASSEMBLY	CSW-30	1	62.	SERIAL NUMBER PLATE FASTENING SCREWS	CSW-3A
15.	LIGHT SUPPORT BRACKET SCREWS	CSW-30G	1	63.	FEED WHEEL SHARP PINN KEY	CSW-3B
16.	LIGHT SUPPORT BRACKET	CSW-30I	1	64.	FEED WHEEL SHARP PINN	CSW-3B
17.	WELT ROLLER HANDLE	CSW-28	1	65.	FEED WHEEL SHARP PINN RETAINING COLLAR	CSW-3C
18.	WELT ROLLER HANDLE SET SCREW	CSW-28A	1	66.	FEED WHEEL SHARP PINN RETAINING COLLAR SET SCREWS	CSW-3D
19.	WELT ROLLER HANDLE SPRING	CSW-28F	1	67.	BLADE SHARP PINN KEY	CSW-2B
20.	WELT ROLLER DRACKET RETAINING SCREW	CSW-26R	2	68.	BLADE SHARP PINN	CSW-2B
21.	WELT ROLLER NUT	CSW-27C	1	69.	BLADE SHARP PINN RETAINING COLLAR	CSW-2C
22.	WELT ROLLER	CSW-27	1	70.	BLADE SHARP PINN RETAINING COLLAR SET SCREWS	CSW-2D
23.	WELT ROLLER BALL BEARING	CSW-27H	1	71.	LOLER COBB	CSW-5B
24.	WELT ROLLER BALL BEARING SCREW	CSW-27B	1	72.	LOLER COBB SHRO	CSW-5
25.	WELT ROLLER PINN KEY SHARP	CSW-27D	1	73.	LOLER COBB SHRO SET SCREW	CSW-5H
26.	WELT ROLLER DAMPENER	CSW-26D	1	74.	LOLER COBB	CSW-6D
27.	WELT ROLLER SHRO SHARP NUT	CSW-26	1	75.	LOLER COBB SHARP	CSW-6D
28.	ON, CUP	CSW-26C	1	76.	LOLER COBB SHARP KEY	CSW-6E
29.	SHIVER TOP ROLL KEY	CSW-15B	1	77.	LOLER COBB SHARP RETAINING BUSH	CSW-6E
30.	SHIVER TOP ROLL RETAINING SCREW	CSW-15D	1	78.	TOP ROLL SHARP COBB KEY	CSW-6H
31.	SHIVER TOP ROLL RETAINING WASHER	CSW-15C	1	79.	WELT ROLLER SHARP PINN	CSW-15F
32.	SHIVER TOP ROLL SHARP	CSW-15A	1	80.	SHIVER WHEEL GUIDE WHEEL	CSW-15D
33.	SHIVER TOP ROLL	CSW-15	1	81.	SHIVER WHEEL GUIDE SCREW	CSW-15E
34.	SHIVER TOP ROLL SHARP SCREW	CSW-15E	1	82.	SHIVER WHEEL GUIDE	CSW-15C
35.	SHIVER TOP ROLL SHARP SCREW	CSW-15E	1	83.	SHIVER WHEEL	CSW-15C
36.	SHIVER TOP ROLL SHARP SCREW	CSW-15E	1	84.	SHIVER WHEEL	CSW-15C
37.	SHIVER TOP ROLL SHARP SCREW	CSW-15E	1	85.	SHIVER WHEEL	CSW-15C
38.	SHIVER TOP ROLL SHARP SCREW	CSW-15E	1	86.	SHIVER WHEEL	CSW-15C
39.	SHIVER TOP ROLL SHARP SCREW	CSW-15E	1	87.	SHIVER WHEEL	CSW-15C
40.	SHIVER TOP ROLL SHARP SCREW	CSW-15E	1	88.	SHIVER WHEEL	CSW-15C
41.	SHIVER TOP ROLL SHARP SCREW	CSW-15E	1	89.	SHIVER WHEEL	CSW-15C
42.	SHIVER TOP ROLL SHARP SCREW	CSW-15E	1	90.	SHIVER WHEEL	CSW-15C
43.	SHIVER TOP ROLL SHARP SCREW	CSW-15E	1	91.	SHIVER WHEEL	CSW-15C
44.	SHIVER TOP ROLL SHARP SCREW	CSW-15E	1	92.	SHIVER WHEEL	CSW-15C
45.	SHIVER TOP ROLL SHARP SCREW	CSW-15E	1	93.	SHIVER WHEEL	CSW-15C
46.	SHIVER TOP ROLL SHARP SCREW	CSW-15E	1	94.	SHIVER WHEEL	CSW-15C
47.	SHIVER TOP ROLL SHARP SCREW	CSW-15E	1	95.	SHIVER WHEEL	CSW-15C
48.	SHIVER TOP ROLL SHARP SCREW	CSW-15E	1	96.	SHIVER WHEEL	CSW-15C
49.	SHIVER TOP ROLL SHARP SCREW	CSW-15E	1	97.	SHIVER WHEEL	CSW-15C

BOOK 4

PATCHING MACHINE

Singer Models

29K58, 29K60, 29K62, 29K70

# Part 3

## Operation, Maintenance & Repair Singer 29K-70 & 29K-71 Patching Machines

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#### DISCLAIMER

This manual is offered as a guide to shoe makers in the care and maintenance of their equipment. Pilgrim Shoe & Sewing Machine offers no guarantee as to the accuracy of this manual. If you are in doubt of your ability to undertake a repair to your machine, call a professional shoe machine mechanic.

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PART FOUR  
PATCHING MACHINE  
CHAPTER 16  
INTRODUCTION

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Section I. GENERAL

156. Scope

a. Part four of this manual contains instructions and information on the operation, maintenance, and repair of the patching machine used to make stitching repairs on the leather uppers of shoes.

b. These instructions are based on the portable patching machine, Singer Sewing Machine Model 29K71 (FSN 3530-254-8386), but also apply to Singer Models 29K70 (FSN 3539-171-1716) and 29KSV19 (FSN 3530-171-2142), used with the mobile Shoe Repair Shop, Trailer-Mounted (par. 1).

157. Requisitioning

All tools and supplies should be requisitioned

158. Forms, Records, and Reports

The forms and reports listed in paragraph 3 apply also to the patching machine and will be used accordingly.

159. Orientation

Throughout part four the terms *right*, *left*, *front*, and *rear* indicate directions from the viewpoint of the operator facing the patching machine in an operating position.

Section II. DESCRIPTION

160. General

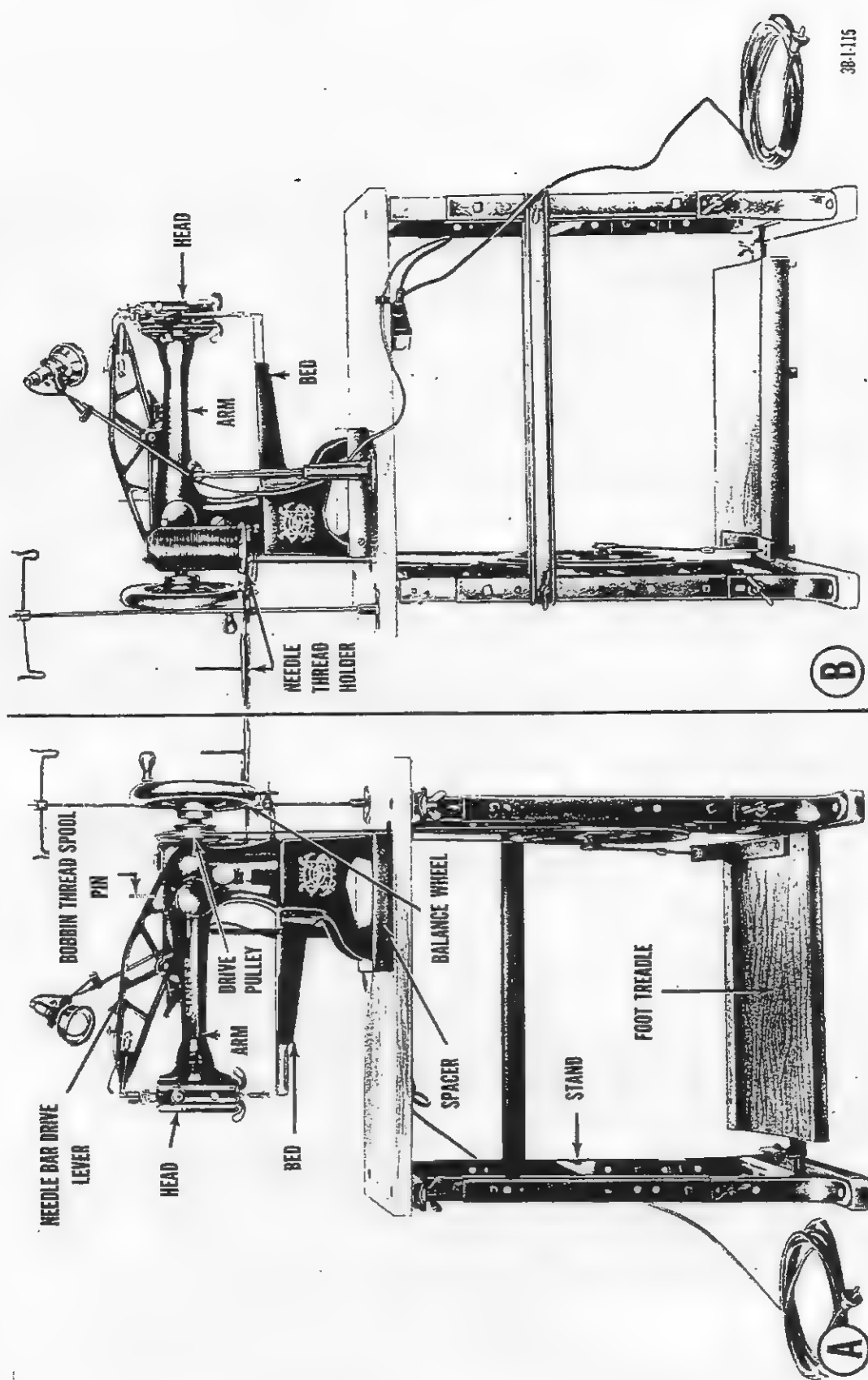
The Singer Model 28K71 patching machine (fig. 115) is a portable, single-needle, lock-stitch, foot-powered machine. The patching machine is carried in the rigging box on the trailer and for operational purposes the machine is removed and installed on a portable folding stand which includes the foot treadle, treadle-driven pulley and drive belt. In transit the stand is folded and carried between the generator and finishing machine on the trailer bed.

161. Components

a. *General.* The patching machine consists of three major assemblies; the arm, the head,

and the bed in which all the parts working together control the action of the thread, needle, and shuttle to form and lock a firm continuous stitch in the leather uppers of the shoe.

b. *Head.* The head is a housing for the needle bar which holds the needle, and is driven by the needle bar drive lever. The head also houses the feeding foot bar to which the feeding foot is attached. The feeding foot feeds or moves the material along as it is sewn. Other parts of the head assembly are the stitch regulator, which measures the length of the stitch, revolving wings, which allow the operator to sew in any direction by turning the wings, and the lifting lever, to lower or raise



A—Front view      B—Rear view

Figure 115. Patching machine.

38-1-115

the feeding foot when material is being inserted or removed.

*c. Bed.* The bed holds the threaded bobbin in the shuttle beneath the needle plate. The bed also contains the shuttle driving assembly, which turns the shuttle to match the action of the needle and its thread so a lockstitch may be formed when the thread is pulled from the bobbin.

*d. Arm.* The arm holds the drive shaft, which turns to set in motion the functional parts of the machine. These parts include the feed motion cam wheel, needle bar drive lever, and a cam. The feed motion cam wheel, at the left end of the drive shaft, controls action

of the feeding foot through movement of the feeding foot bar to which it is attached. The right end of the needle bar drive lever revolves in an eccentric race in the drive pulley to control action of the needle attached to the lower end of the needle bar. The cam revolves on a shaft in the right end of the arm, and controls action of the shuttle drive gears in the gearbox by a cam lever running down through the column.

## 162. Tools and Repair Parts.

A list of tools and supplies for the patching machine appears in paragraphs 204 and 205.



the feeding foot when material is being inserted or removed.

*c. Bed.* The bed holds the threaded bobbin in the shuttle beneath the needle plate. The bed also contains the shuttle driving assembly, which turns the shuttle to match the action of the needle and its thread so a lockstitch may be formed when the thread is pulled from the bobbin.

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## 162. Tools and Repair Parts.

A list of tools and supplies for the patching machine appears in paragraphs 204 and 205.

### Section III. OPERATIONAL ADJUSTMENTS

#### 169. General

The patching machine can be adjusted to change length of stitch, position and lift of feeding foot, thread tension, and tension and movement of takeup lever to conform to different types of material being repaired. Once these adjustments are made for normal operation in the field for Army footwear, there is little need for further adjustment except for thread tension. Adjustments will be made as indicated in paragraphs 170 through 173.

#### 170. Adjusting Length of Stitch

a. The length of the stitch depends upon thickness of material being repaired; a short stitch is used for heavy material and a long stitch for lighter material. The stitch regulator (fig. 116) regulates the length of the stitch by changing the number of stitches to the inch. A thumbscrew holds the regulator in position at the rear of the feeding foot bar. Each of the numbers stamped on the feed motion bell crank lever indicates the number of stitches that will be made per inch when the regulator is set at a particular point.

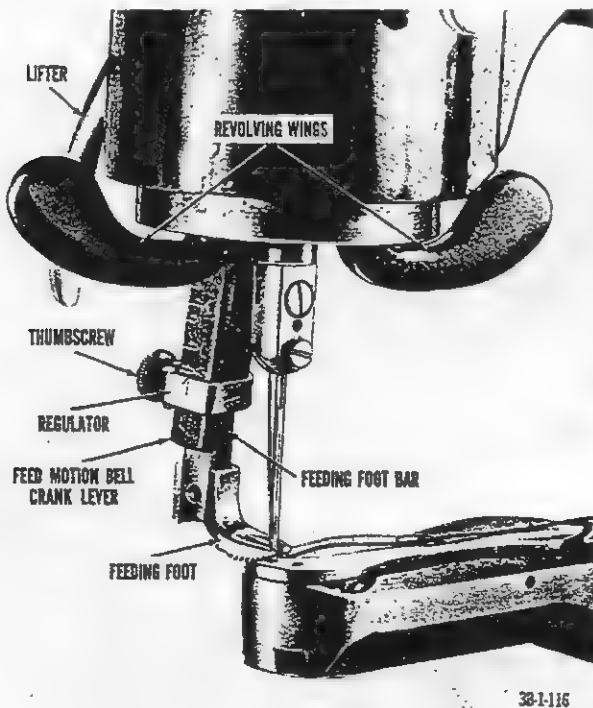


Figure 116. Stitch regulator.

b. Loosen thumbscrew, move regulator to desired point, and tighten thumbscrew to change length of stitch.

#### 171. Adjusting Feeding Foot

##### a. Regulating Pressure on Material.

- (1) Pressure of the feeding foot must only be heavy enough to feed the material being repaired; leather will require a heavier pressure than other materials.
- (2) Regulate pressure of feeding foot by adjusting presser spring bar adjusting nut (fig. 117). Tighten nut to increase pressure; loosen to reduce pressure.

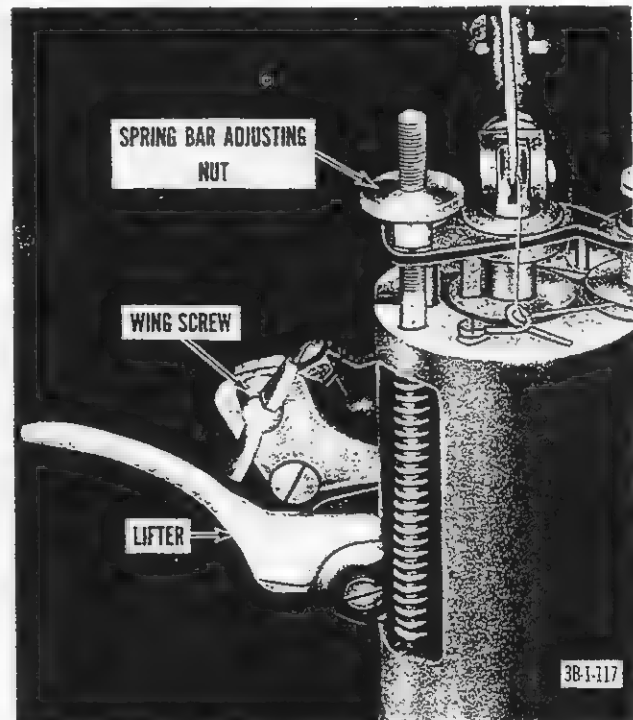


Figure 117. Feeding foot adjustments.

##### b. Regulating Automatic Feed Lift.

- (1) During operation, the feeding foot rises after it has moved the work toward the rear of the machine, then the foot moves toward the needle and comes down again on the leather. The lift of the feeding foot should be only enough to clear the thickest part of the material passing under the needle.

- (2) Adjust lift of feeding foot by pushing up on lifter (fig. 117) to raise foot. Loosen wing screw, then move screw forward to increase lift of foot or to rear to reduce lift, and tighten wing screw.

## 172. Adjusting Thread Tensions

Tension of needle and bobbin threads should be equal and strong enough to lock both threads in center of work (fig. 118). If tension of one thread is stronger than the other, an imperfect stitch will be formed.

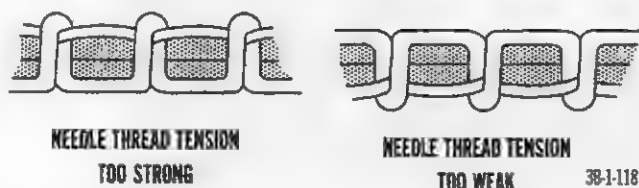


Figure 118. Effect of thread tension on stitch.

### a. Regulating Tension on Needle Thread.

- (1) A correct stitch can usually be obtained by varying tension on the needle thread. This tension is controlled by tension disks (fig. 119) as the thread passes between them.
- (2) Regulate tension between disks by turning thread tension stud thumb nut, turning nut to right to increase tension on thread and to left to lessen tension.

### b. Regulating Tension on Bobbin Thread.

Tension of bobbin thread will rarely have to be adjusted; to adjust, tighten small screw in end of tension spring in side of the shuttle (fig. 120) to increase the tension, or loosen screw slightly to lessen tension.

## 173. Adjusting Thread Takeup Check Lever

### a. Regulating Spring Tension.

- (1) Spring tension on the thread takeup check lever (fig. 121) should be set to

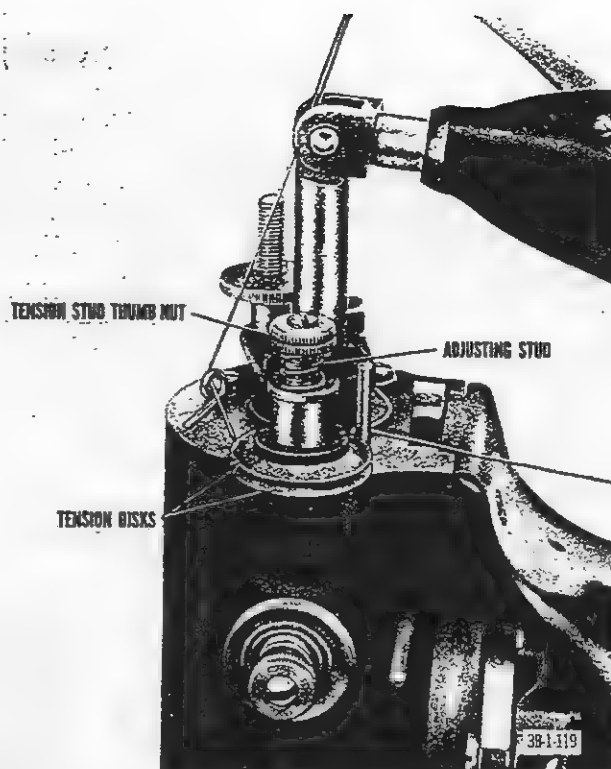


Figure 119. Thread tension adjustment

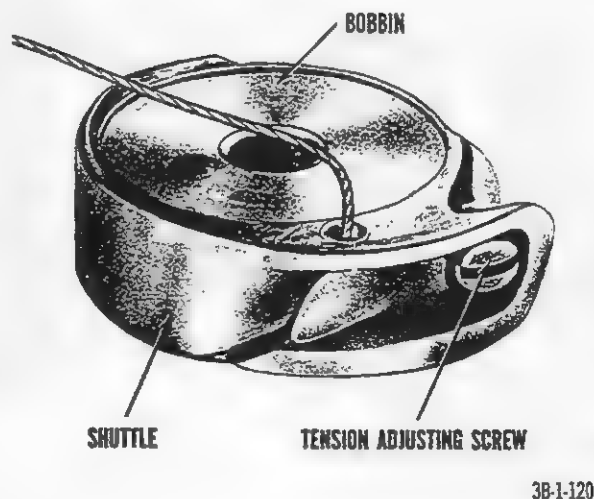


Figure 120. Bobbin thread adjustment.

work together with the needle thread tension controlled by the tension disks (par. 172a). When the needle bar reaches the top of its stroke, as in figure 121, the check lever should be held down far enough by tension of

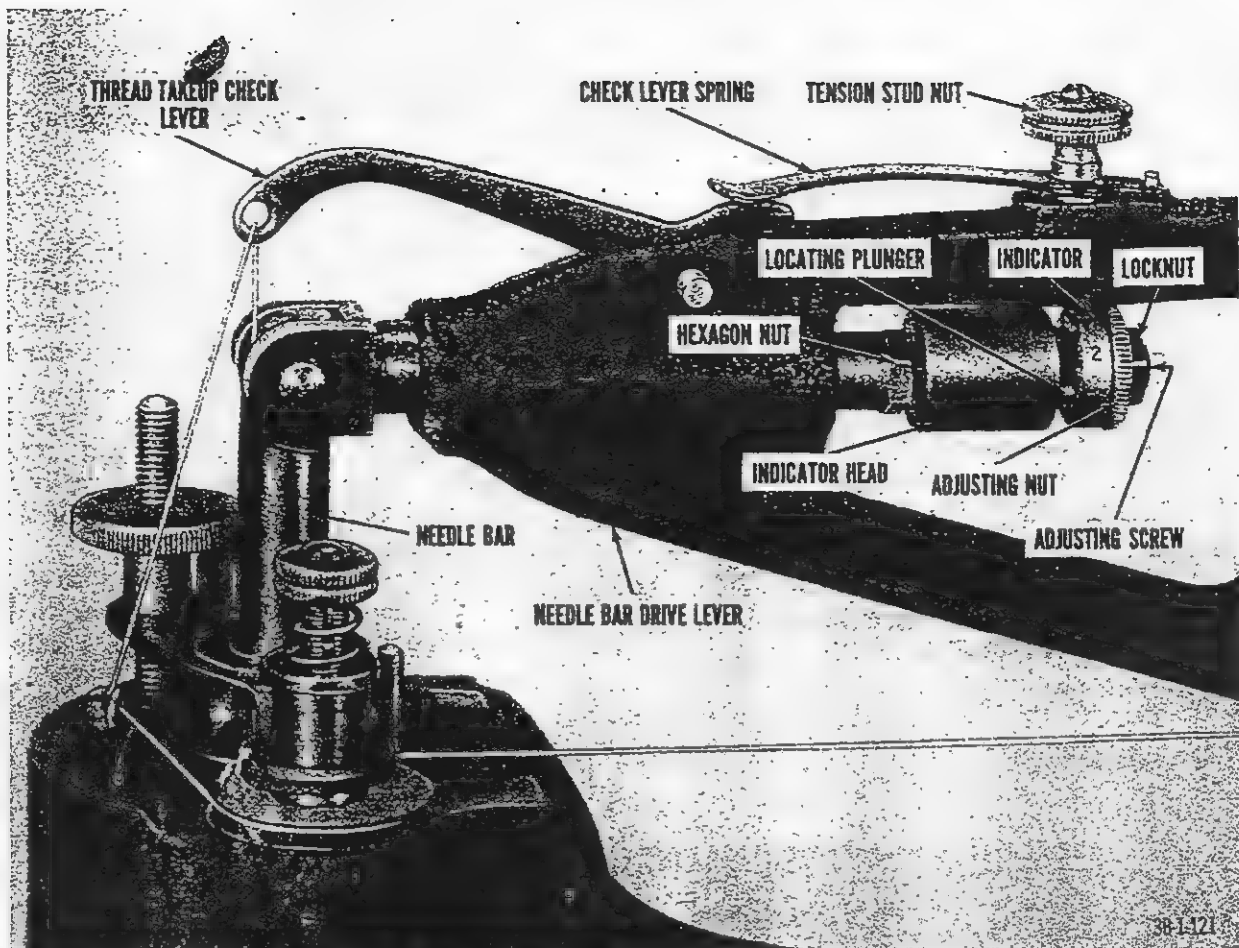


Figure 121. Thread takeup check lever adjustment.

the thread so the takeup action will keep the thread taut until the needle enters the work. With heavy material such as leather, tension on the check lever must be increased or decreased as needle thread tension in the tension disks is adjusted.

- (2) Spring tension on the check lever is controlled by the check lever tension stud nut; to increase tension, tighten the nut and to decrease tension, loosen the nut.

*b. Regulating Stroke.*

- (1) Different types of material need different amounts of thread in sewing operations. Heavy material such as

leather requires more thread than thin material. The amount of thread fed through the needle bar is controlled by the length of the stroke (up-and-down movement) of the takeup lever. This stroke is regulated by the regulator indicator adjusting nut (fig. 121); the barrel of this nut is marked from 0 to 4.

- (2) For thin material, turn adjusting nut until zero mark is opposite locating plunger. For heavier materials such as Army footwear, turn nut to suit general thicknesses of materials and thread. Once this adjustment is made there will be little need for further adjustment.

## Section IV. OPERATION UNDER USUAL CONDITIONS

### 174. General

Operation of the patching machine will normally be the same under any conditions which the operator can endure. Extreme conditions will have little effect on operation if thread is kept dry, and proper lubrication (pars. 178 and 179) and maintenance (pars. 180-189) are performed.

### 175. Preparation for Operation

#### a. Select Proper Needle and Needle Plate.

- (1) *Needle selection.* Size of needle to be used is determined by size and type of thread and weight of leather to be worked. Thread must pass freely through eye of needle for proper operation of machine.
- (2) *Needle plate selection.* Two double-end needle plates are furnished with the patching machine. Each needle plate (fig. 122) is marked at both ends with sizes of needles it will accommodate. Install proper needle

plate for needle to machine and place needle plate in the correct position.

b. *Change Needle Plate.* Remove needle plate screw (fig. 122) and plate, install proper plate, and install screw.

c. *Change Needle.* Refer to figure 122, and proceed as follows:

- (1) Move balance wheel by hand until needle bar is in its highest position.
- (2) Loosen needle clamping screw, hold balance wheel with right hand, and remove needle from clamp.
- (3) Insert new needle into clamp as far as it will go, with long groove in needle to left and eye directly in line with arm of machine. Tighten needle clamping screw.
- (4) Loosen needle bar clamp screw, move clamp to right or left until needle can pass through center of needle plate hole when needle descends, and tighten clamp screw.

#### d. Thread Machine.

- (1) Place reel of thread on thread holder (B, fig. 115) so thread will draw from rear of spool. Bring thread over thread guide (A, fig. 123), then down through hole in bobbin thread spool pin.
- (2) Raise spring in oilcup, pass thread under spring, and press spring back into position.
- (3) Pass thread around back of friction spring pin (A and B, fig. 123), toward front to right of tension disks, and from right to left between disks.
- (4) Pass thread through wire eyelet (B, fig. 123) and through hole in end of thread takeup check lever from front to rear.
- (5) Draw 10 inches of thread through parts threaded in (2) through (4) above, and insert end of thread into slit in end of threading wire (C, fig. 123).
- (6) Pass wire from rear of takeup check lever down through needle bar.
- (7) When thread appears at hole in lower end of needle bar, remove thread from threading wire, and withdraw wire.

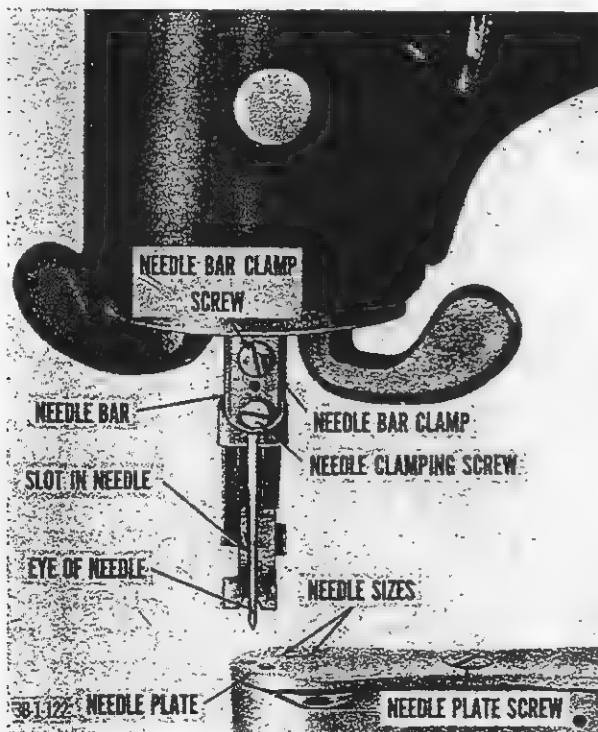
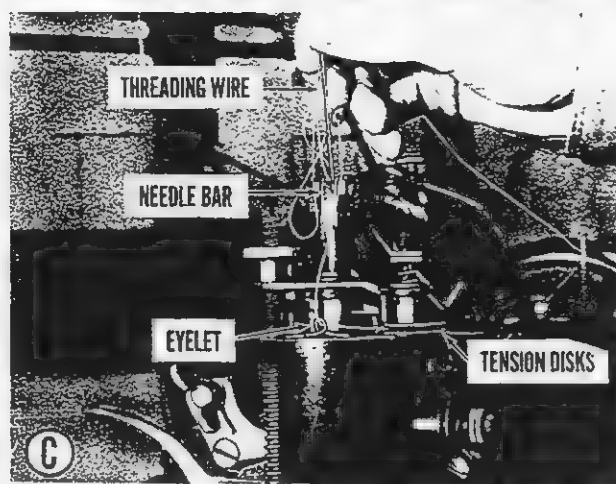
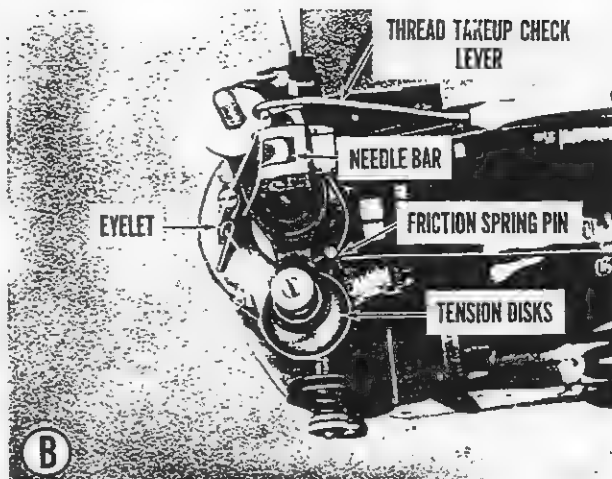
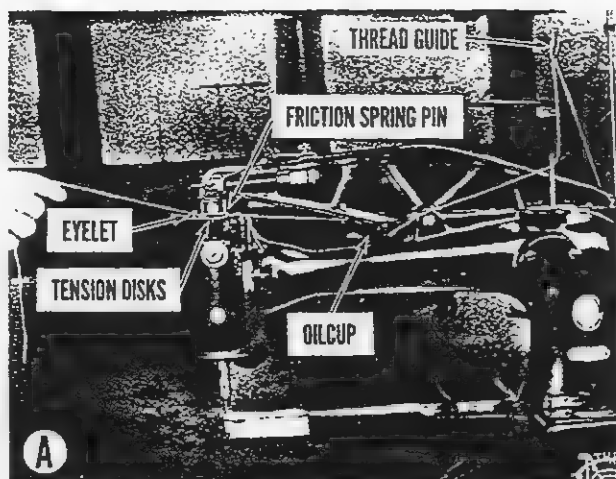


Figure 122. Setting needle.



A—Passing thread from spool to oilcup and to friction spring pin  
B—Thread passing between tension disks

C—Passing thread down through head and needle bar  
D—Needle threaded

Figure 123. Threading machine.

- (8) Pass the thread through eye of needle from left to right (D, fig. 123) so thread extends 3 or 4 inches beyond needle.

*e. Service Bobbin.* Before operation, and occasionally during operation, it will be necessary to remove bobbin, rewind it, thread shuttle, and replace bobbin.

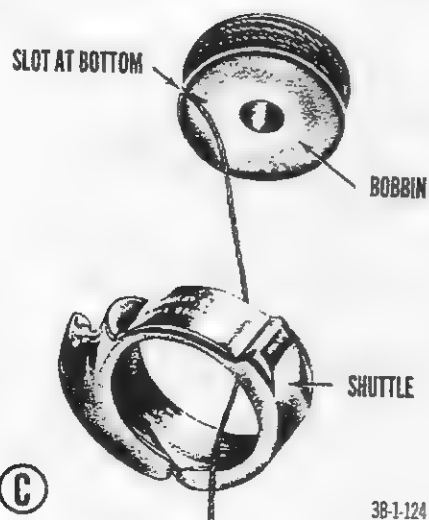
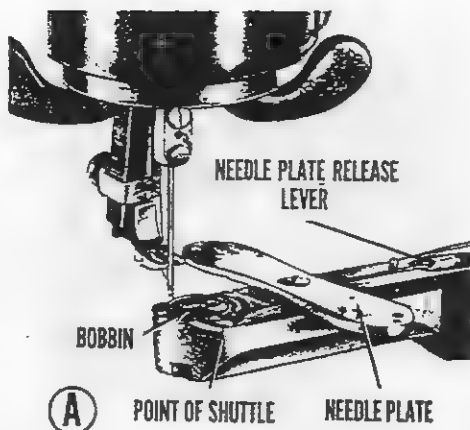
- (1) *Remove bobbin.* Refer to A, figure 124, and proceed as follows:
  - (a) Turn balance wheel by hand to raise needle to its highest position so that it clears needle plate.
  - (b) Raise lifter at rear of head to raise feeding foot.

- (c) Press down on needle plate release lever, and swing needle plate across shuttle driving gearbox.

- (d) Turn balance wheel until point of shuttle is to front, remove shuttle with bobbin, turn shuttle over, and release bobbin.

- (2) *Adjust balance wheel.* Refer to B, figure 124, and proceed as follows:

- (a) Pull out on stop motion plunger, and turn plunger slightly to right or left to release balance wheel so wheel will run free of machine.
- (b) Wind bobbin on bobbin winder ((3) below).



38-1-124

Figure 124. Bobbin service.

A—Bobbin and shuttle removal  
B—Balance wheel adjustment and bobbin winding  
C—Thread dropped through shuttle

Figure 124—Continued.

- (c) Turn stop motion plunger slightly while turning balance wheel slowly, and allow plunger to engage hole in inner disk.
- (3) *Wind bobbin.*
  - (a) Place spool of thread on bobbin thread spool pin on arm (A, fig. 115).
  - (b) Place thread in small hole in hub of bobbin.
  - (c) Place bobbin on winder spindle (B, fig. 124) with slot in slide of bobbin facing machine.
  - (d) Turn eccentric thumbscrew to left, lower screw in its slot until rubber ring of spindle pulley presses against balance wheel, and tighten thumbscrew.
  - (e) Turn balance wheel forward, guide thread with fingers so thread will wind smoothly, and cut thread between bobbin and spool when thread is just short of filling bobbin.
  - (f) Remove bobbin from spindle, and pass end of thread into slot in edge of bobbin (C, fig. 124).
  - (g) Loosen eccentric thumbscrew on winder, move screw up until rubber wheel ring does not touch balance wheel, and tighten thumbscrew.
- (4) *Thread shuttle.*
  - (a) Hold bobbin in right hand with slot in edge of bobbin at bottom (C, fig. 124). Allow 2 or 3 inches of thread to hang free from bobbin.
  - (b) Hold shuttle in left hand with wide opening of shuttle at top. Allow end of thread to pass through shuttle.
  - (c) Drop bobbin into shuttle, hold bobbin in shuttle, and turn shuttle over. Draw thread into slot in edge of shuttle and under end of tension spring and pass end of thread up through small hole in upper edge of shuttle (fig. 120).



(5) *Replace shuttle.*

- (a) Turn balance wheel until upright part of shuttle carrier is to right.
- (b) Place shuttle and bobbin in place, with point of shuttle (A, fig. 124) to front and pointing to right.
- (c) Place needle bar in its highest position, press needle plate release lever, and turn needle plate to sewing position.

*f. Prepare Thread for Sewing.*

- (1) Hold end of needle thread in left hand, leaving thread slack from hand to needle.
- (2) Turn balance wheel forward until needle moves down and up again to its highest point. Motion of needle will catch bobbin thread.
- (3) Pull end of thread that is being held; as thread tightens, bobbin thread will be brought up with it through needle plate (fig. 125). Lay both ends of thread back under feeding foot.

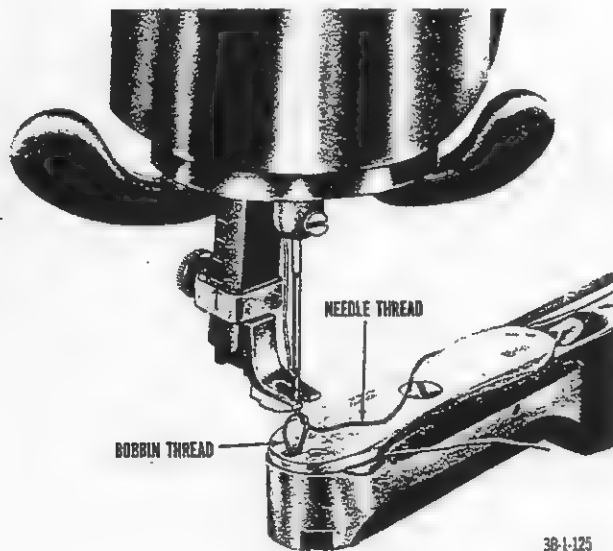


Figure 125. Thread prepared for sewing.

*g. Set Length of Stitch.* Refer to paragraph 170.

*h. Adjust Feeding Foot.* Adjust feeding foot for proper pressure and lift (par. 171).

*i. Check Thread Tension.* Check thread tension and adjust if necessary (par. 172).

*j. Lubricate.* Lubricate machine (pars. 178 and 179).

*k. Test.* Test by sewing piece of scrap material to check for proper working order.

## 176. Operation

*a. Insert Material.*

- (1) Turn balance wheel forward to raise needle bar.
- (2) Push lifter up to raise feeding foot.
- (3) Insert material under feeding foot.
- (4) Place 3 or 4 inches of thread to rear of feeding foot, and lower foot on material by bringing lifter down.

*b. Start Machine.* Place both feet on treadle, turn balance wheel forward, move feet freely with motion of treadle until machine settles into a regular, easy movement.

*c. Commence Sewing.*

- (1) Guide material as it is moved along by the feeding foot; pulling or jerking on material may cause needle deflection and breakage.
- (2) Direction of the stitch can be changed as desired. Use revolving wings (par. 166) to make a curved line of stitching. To turn a corner with the stitch, stop machine and turn balance wheel forward until feeding foot rises from material, then turn work as desired, using the needle as a pivot. The feeding foot may be adjusted to work in a straight line in any direction by tightening the setscrew on the face of the head of the machine (A, fig. 115). Do not turn the work or alter direction of feed while feeding foot is pressing on material; this may cause missed stitches and may damage the surface of the work.

*d. Remove Material.* Raise needle bar to its highest position by turning balance wheel, and lift feeding foot by raising lifter. Draw material 3 inches back of needle and cut threads close to the work. Leave both ends of thread under feeding foot.



### 177. Precautions

To insure proper operation, observe following precautions:

a. Always turn balance wheel toward operator.

b. Feeding foot must be raised except when sewing.

c. Do not work machine with shuttle and needle threaded unless there is material under feeding foot.

d. Avoid pulling material when stitching.

## CHAPTER 18

### ORGANIZATIONAL MAINTENANCE

---

#### Section I. LUBRICATION

##### 178. Lubrication Chart

*a.* The lubrication chart (fig. 126) prescribes lubrication points, intervals, procedures, and lubricants for the patching machine.

*b.* The intervals specified in the lubrication chart are for normal operating conditions and continuous use of the equipment. Time between intervals should be reduced under extreme conditions, such as excessively high or low temperatures and prolonged periods of operation in sandy or dusty areas. Time be-

tween intervals may be extended when the equipment is not in continuous use.

##### 179. Specific Instructions

*a.* Lubrication fittings, oilholes, and oilcup can be located by reference to the lubrication chart.

*b.* Wipe lubrication points and surrounding surfaces clean before applying lubricant. Clean all parts with SD unless otherwise specified. Let parts dry thoroughly before applying lubricant.

#### Section II. PREVENTIVE MAINTENANCE

##### 180. Responsibility

The preventive maintenance services are a responsibility of the using organization. These services consist of before-, during-, and after-operation services.

##### 181. Before-Operation Service

*a.* Inspect for damaged, loose, or missing parts.

*b.* Check needle and feeding foot to make sure they are properly set.

*c.* If the needle is changed, make sure proper needle plate is installed, and that needle works into plate properly.

*d.* Check bobbin for threading and cleanliness.

*e.* Make sure needle thread is properly threaded.

*f.* Clean all parts.

*g.* Lubricate machine (pars. 178 and 179).

*h.* Make necessary adjustments of length of stitch, feeding foot, and thread tension.

*i.* Operate machine with piece of scrap material to make sure machine operates correctly.

*j.* Report any unsatisfactory condition that cannot be corrected.

##### 182. During-Operation Service

*a.* Clean dust, grit, and lint from shuttle.

*b.* Oil shuttle each time bobbin is rewound.

*c.* Make any necessary adjustments.

##### 183. After-Operation Service

*a.* Clean all parts of machine thoroughly; be sure to include shuttle and shuttle carrier.

*b.* Lubricate machine (pars. 178 and 179).

*c.* Rewind bobbin if necessary.

*d.* Report any unsatisfactory condition that cannot be corrected.

# LUBRICATION CHART

## SHOE PATCHING MACHINE

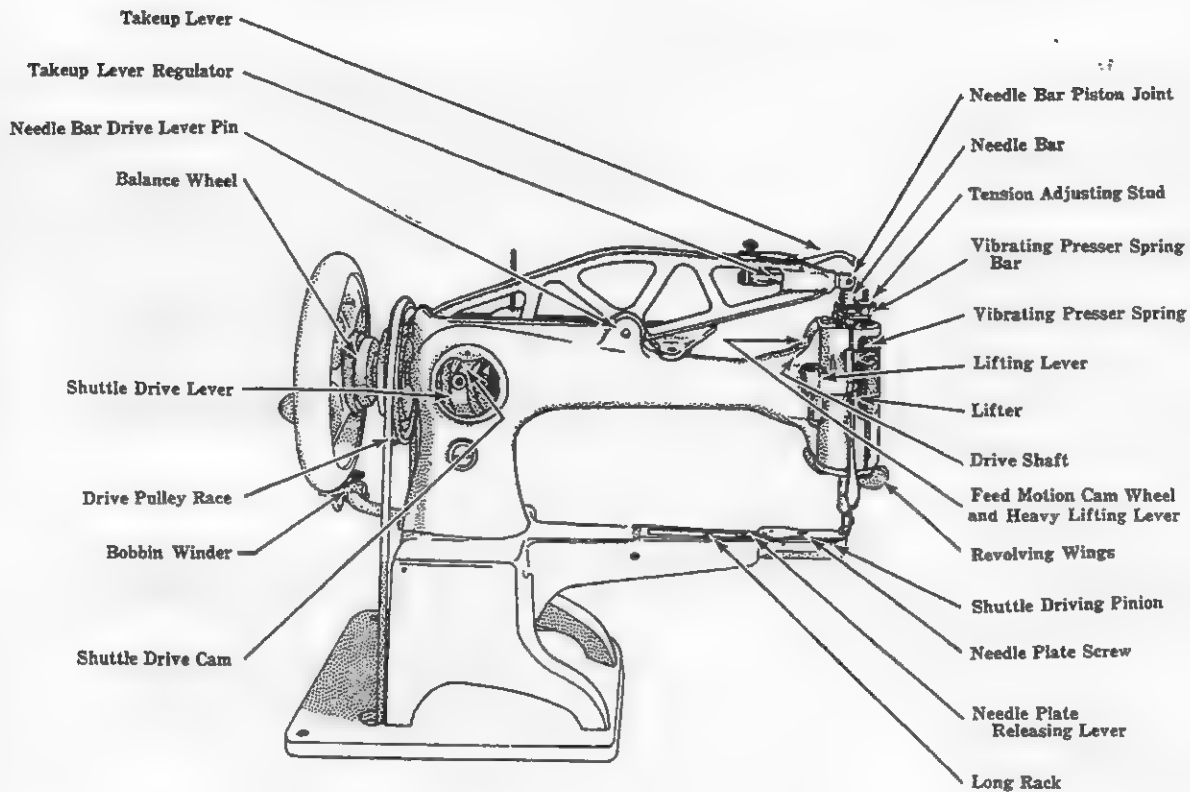
(SINGER SEWING MACHINE MODELS 29K71, 29K70, 29KSV19)

Intervals given are maximums for normal operation. For abnormal conditions or activities, intervals should be shortened to compensate. Extend when not in use.

Clean all parts with Solvent, dry-cleaning (SD).

Dry before lubricating.

For intervals and lubricants refer to KEY.



—KEY—

LUBRICANT	ALL TEMPERATURES	INTERVALS
LO—Lubricating Oil, General Purpose	LO	Every four hours

38-1-126

Figure 126. Lubrication chart, patching machine.

### Section III. TROUBLESHOOTING

#### 184. General

Troubleshooting information is designed to help organizational personnel quickly locate and correct any troubles that may develop during operation.

#### 185. Troubleshooting Chart

Some of the more common troubles that may develop in the patching machine, their possible causes, and suggested remedies are listed in table IV.

Table IV. Troubleshooting Chart, Patching Machine

Trouble	Cause	Remedy
Broken needle	Needle loose in clamp.	Tighten clamping screw.
	Needle of wrong size.	Use proper size needle for work.
	Feeding foot loose or out of line.	Adjust feeding foot properly and tighten setscrew.
	Operator pulling on material.	Guide material; feeding foot moves material.
	Attempting to turn needle plate while needle is down.	Raise needle bar to highest position before moving needle plate.
Broken needle thread.	Incorrect threading of machine.	Thread machine correctly (par. 175d).

Table IV—Continued

Trouble	Cause	Remedy
Broken bobbin thread.	Thread tension too tight.	Adjust tension disks.
	Needle set incorrectly.	Set needle properly (par. 175c).
	Sharp edge on shuttle or tension spring.	Remove sharp edges with emery cloth.
	Needle rubbing against feeding foot.	Adjust and tighten feeding foot.
	Defective or incorrect size thread.	Use smooth, dry, evenly twisted thread of proper size.
	Shuttle incorrectly threaded.	Thread shuttle correctly (par. 175e(4)).
	Bobbin wound too full.	Wind thread on bobbin just below level of bobbin rims.
	Bobbin tension too tight.	Adjust tension (par. 172b).
	Rounds of thread on bobbin cross one another.	Rewind bobbin with correct thread tension to lay smooth layers of thread.
	Shuttle sticky with oil or lint.	Clean shuttle and lubricate properly (pars. 178 and 179).
Skipping of stitch.	Needle thread fails to catch bobbin thread.	Time shuttle (par. 188).
Drawing of seam.	Thread tension too tight on needle and bobbin.	Adjust thread tensions (par. 172).

### Section IV. UNIT MAINTENANCE

#### 186. Responsibility

Adjustments and replacements in paragraphs 187 through 189 are the responsibility of the using organization. These adjustments are operational in nature, but will not be performed by the operator.

#### 187. Adjusting Thread Takeup Check Lever Regulator Indicator

a. Normal adjustment of the thread takeup check lever regulator indicator (par. 173b) will generally suffice for repair of Army footwear, but the range of the indicator can be increased by an adjusting screw (fig. 121).

b. To alter range of indicator, refer to figure 121, and proceed as follows:

- (1) Loosen locknut.
- (2) Use screwdriver to turn adjusting screw. Turn to right to reduce travel

range of the check lever; to left, to increase range. Wear at tip of adjusting screw can also be taken up in this manner.

- (3) When proper adjustment has been made, tighten locknut.
- (4) Be sure hexagon nut is locked against needle bar drive lever.

#### 188. Timing Shuttle

a. A lockstitch is properly formed for sewing only when the shuttle carrier is timed to bring the shuttle and bobbin thread into the correct position so the needle will pick up the bobbin thread on its upward movement from beneath the needle plate.

b. The shuttle is timed by an eccentric screw stud connecting the shuttle driving lever and the long rack connecting rod (fig. 127). This stud is reached with a screwdriver

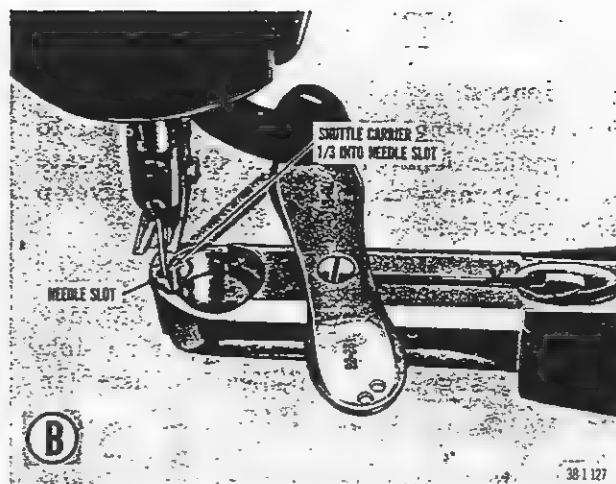
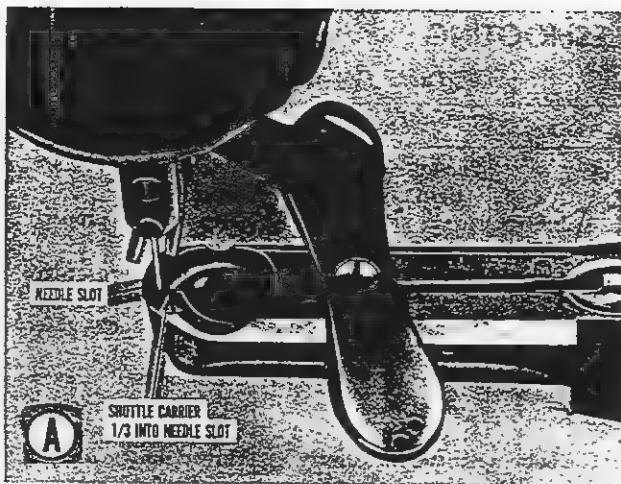


Figure 127. Timing shuttle.

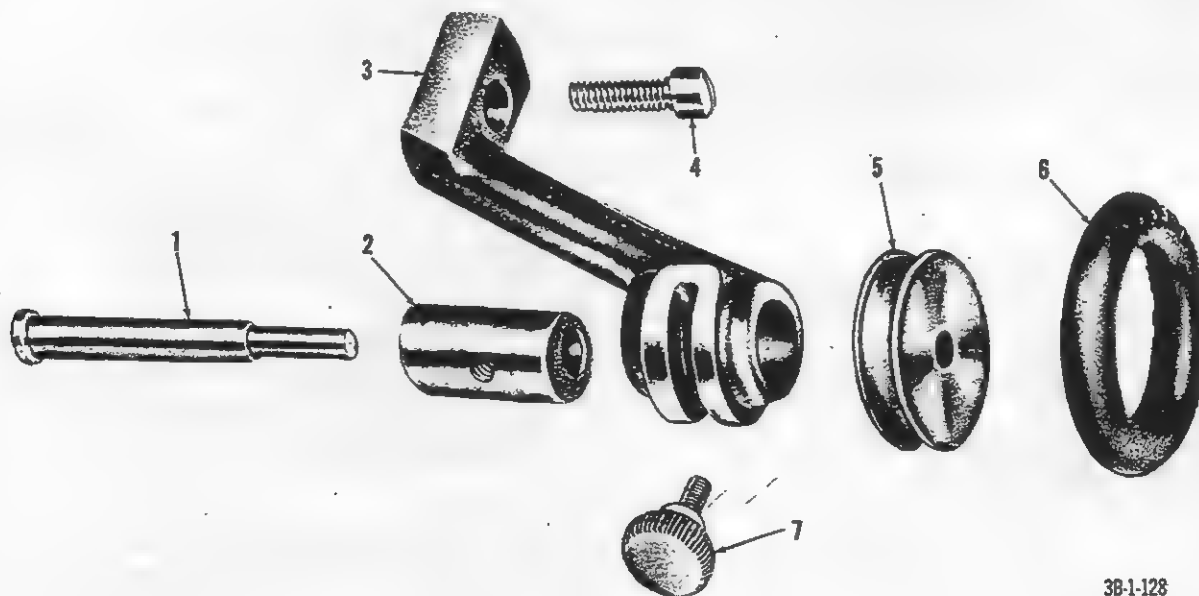
through a hole at the front side of the machine base.

c. Turn eccentric screw stud until leading edge of shuttle carrier moves at each oscillation (forward motion) to a position approximately one-third the distance across the needle slot.

### 189. Servicing Bobbin Winder

a. *Disassembly.* Refer to figure 128, and proceed as follows:

- (1) Remove frame screw (4) from frame (3), and remove assembly from base of machine.



- |               |                              |
|---------------|------------------------------|
| 1 Spindle     | 5 Spindle pulley             |
| 2 Eccentric   | 6 Spindle pulley rubber ring |
| 3 Frame       | 7 Eccentric thumbscrew       |
| 4 Frame screw |                              |

Figure 128. Bobbin winder, exploded view.

- (2) Remove eccentric thumbscrew (7) from eccentric (2).
  - (3) Remove rubber ring (6) from spindle pulley (5).
  - (4) Remove spindle pulley from spindle (1).
  - (5) Remove spindle from frame.
  - (6) Remove eccentric from frame.
- b. *Reassembly.*
- (1) Reverse procedure in a above.

- (2) When attaching frame to base of machine with frame screw, be sure frame is set in slot in base so pulley will separate from balance wheel when thumbscrew is moved upward.
- (3) If pulley maintains any contact with balance wheel after screw has been moved to neutral position, pulley will create heavy drag on operation of machine.

## CHAPTER 19

### FIELD AND DEPOT MAINTENANCE

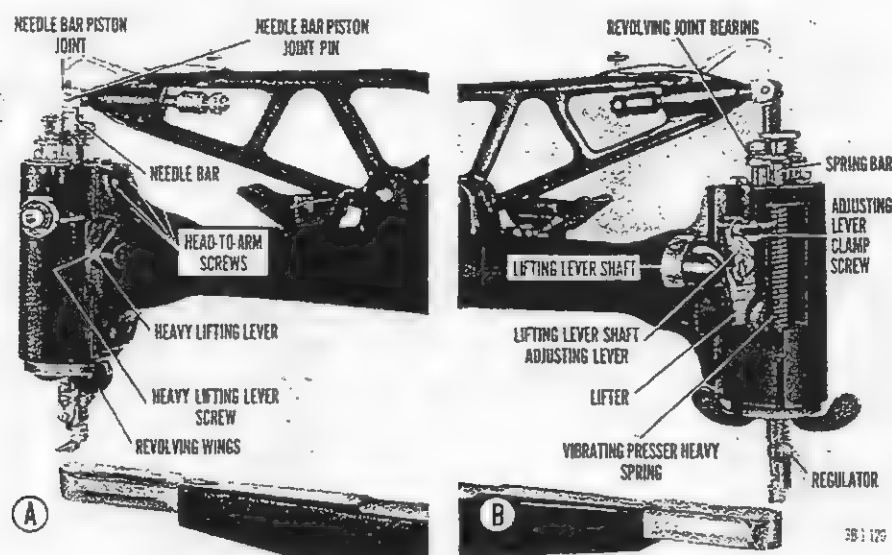
#### 190. Patcher Head

##### a. Removal.

- (1) Remove needle bar piston joint pin (A, fig. 129) from needle bar piston joint and needle bar (10, fig. 130).

- (3) Remove arm thread tension stud thumb nut (49), top spring (48), and release cup (47) from adjusting stud (40).

- (4) Remove vibrating presser spring bar



A—Front      B—Rear  
Figure 129. Patcher head.

- (2) Remove 4 head binding screws (53), and release head from arm.

##### b. Disassembly.

- (1) Remove arm thread tension side stud thumb nut (36), side spring (35), and side disks (34) from side adjusting stud (37). Remove stud from patcher head (31).
- (2) Remove arm thread tension side guide pin (33) and revolving bushing stop thumbscrew (32) from patcher head.

- adjusting nut (52) from spring bar (51).

- (5) Remove feeding foot bar revolving joint upper locknut (13) from slide rod (15).
- (6) Remove feeding foot bar revolving joint hinge pin (50) from bearing (46), and remove bearing from needle bar, arm thread tension top adjusting stud, vibrating presser spring bar, and feeding foot revolving joint slide rod.

- (7) Remove feeding foot revolving joint lower locknut (14) from slide rod.
- (8) Remove arm thread tension top disks (45) and leather washer (44) from adjusting stud, and remove adjusting stud from patcher head.
- (9) Remove thread guide screw (41), head thread guide (38), revolving bushing friction spring screw (19), spring (20), pin (39), revolving bushing supporting washer screws (43), and washer (42) from patcher head.
- (10) Press vibrating presser spring bar down until collar (29) is clear of patcher head, remove screw (28) from collar, remove collar from spring bar, and remove spring bar and heavy spring (18) from patcher head.
- (11) Remove vibrating presser lifting lever shaft adjusting lever clamping screw (17) from shaft (22).
- (12) Remove vibrating presser lifting lever shaft adjusting lever hinge screw (16) from patcher head to release the lever (21).
- (13) Remove feeding foot bar revolving joint slide rod from patcher head.
- (14) Remove vibrating presser lifting lever screw (25) from heavy work lifting lever (26) and arm housing (A, fig. 129), and remove lever.
- (15) Remove vibrating presser lifting lever shaft lever screw (23, fig. 130) from lever (24), remove lever shaft (22), and remove shaft from patcher head.
- (16) Remove vibrating presser lifter hinge screw (30) from patcher head to release the lifter (27).
- (17) Remove feeding foot screw (60) from feeding foot bar (9) to release the feeding foot (59).
- (18) Remove stitch regulator thumbscrew (7) from regulator (8), and slide regulator off feed motion bell crank lever (5) and feeding foot bar to release the stitch regulator gib (6).
- (19) Pull feeding foot bar from revolving bushing (3), revolving bushing handle (4), and feed motion bell crank lever.

- (20) Remove needle bar assembly from head through revolving bushing.
- (21) Remove needle bar thread tension spring screws (54) to release the spring (55).
- (22) Remove needle clamping screw (57) and needle bar needle clamp screw (58) from clamp (56) to release the clamp.
- (23) Remove revolving bushing handle screws (11) from bushing, and slide handle with feed motion bell crank lever from patcher head.
- (24) Remove feed motion bell crank lever screws (12) from revolving bushing handle to release the feed motion bell crank lever.
- (25) Remove feed motion ring slide bar (1) from patcher head, and remove slide bar roll (2) from bar.
- (26) Remove revolving bushing from head.

*c. Reassembly and Installation.* Reverse procedures in *a* and *b* above.

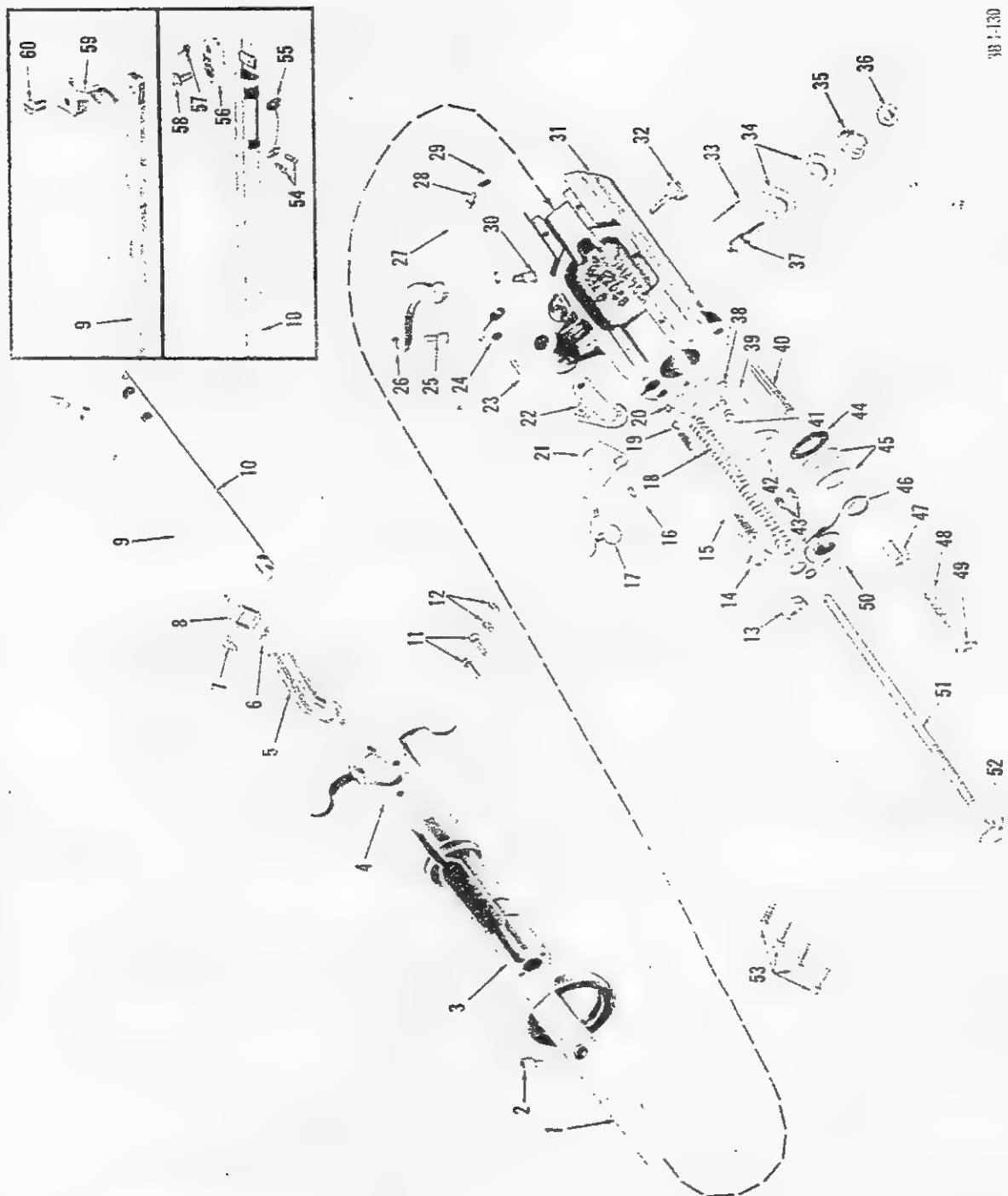
## 191. Patcher Bed

The patcher bed (A, fig. 115) houses the shuttle, bobbin, and shuttle drive assembly (par. 161c). The shuttle drive lever, extending up through the machine column with a cam roll fitting into the cam on the drive shaft, is considered a part of the shuttle drive assembly and is included in instructions below. The gearbox (1, fig. 131) may be removed and disassembled as a unit (*a*(1)(6) and *b*(1) through (11) below).

### *a. Removal.*

- (1) Detach patching machine from stand by releasing drive belt and removing screws at 4 corners of base holding base to spacer.
- (2) Tip machine to vertical position as shown in figure 131.
- (3) Turn balance wheel until shuttle drive lever connecting rod hinge screw (7) comes into position opposite opening in rear side of bed (fig. 132).
- (4) Insert screwdriver through opening, and remove hinge screw.





38 130

Figure 130. Patcher head, exploded view.

1	Feed motion ring slide bar	30	Vibrating presser lifter hinge screw
2	Feed motion ring slide bar roll	31	Patcher head
3	Revolving bushing	32	Revolving bushing stop thumbscrew
4	Revolving bushing handle (revolving wings)	33	Arm thread tension side guide pin
5	Feed motion bell crank lever	34	Arm thread tension side disks
6	Stitch regulator gib	35	Arm thread tension side spring
7	Stitch regulator thumbscrew	36	Arm thread tension side stud thumb nut
8	Stitch regulator	37	Arm thread tension side adjusting stud
9	Feeding foot bar	38	Head thread guide
10	Needle bar assembly	39	Revolving bushing friction spring pin
11	Revolving bushing handle screws	40	Arm thread tension top adjusting stud
12	Feed motion bell crank lever screws	41	Thread guide screw
13	Feeding foot bar revolving joint upper locknut	42	Revolving bushing supporting washer
14	Feeding foot bar revolving joint lower locknut	43	Revolving bushing supporting washer screws
15	Feeding foot bar revolving joint slide rod	44	Arm thread tension top disk leather washer
16	Vibrating presser lifting lever shaft adjusting lever hinge screw	45	Arm thread tension top disks
17	Vibrating presser lifting lever shaft adjusting lever clamping screw	46	Feeding foot bar revolving joint bearing
18	Vibrating presser heavy spring	47	Arm thread tension release cup
19	Revolving bushing friction spring screw	48	Arm thread tension top spring
20	Revolving bushing friction spring	49	Arm thread tension stud thumb nut
21	Vibrating presser lifting lever shaft adjusting lever	50	Feeding foot bar revolving joint hinge pin
22	Vibrating presser lifting lever shaft	51	Vibrating presser spring bar
23	Vibrating presser lifting lever shaft lever screw	52	Vibrating presser spring bar adjusting nut
24	Vibrating presser lifting lever shaft lever	53	Head binding screws
25	Vibrating presser lifting lever screw	54	Needle bar thread tension spring screws
26	Vibrating presser heavy work lifting lever	55	Needle bar thread tension spring
27	Vibrating presser lifter	56	Needle bar clamp
28	Vibrating presser spring bar collar screw	57	Needle clamping screw
29	Vibrating presser spring bar collar	58	Needle bar needle clamp screw
		59	Feeding foot
		60	Feeding foot screw

Figure 130—Continued.

(5) Remove 2 shuttle drive gearbox screws (2, fig. 131) and positioning pin (9).

(6) Set machine level and remove shuttle drive gearbox (1) by pulling gearbox away from bed in a horizontal direction. Do not attempt to lift gearbox from housing, as this will crack the long rack (3).

(7) Remove shuttle drive lever bearing screw (fig. 132) from rear of machine column.

(8) Turn balance wheel until cam roll of shuttle drive lever (fig. 132) is free of shuttle drive cam. Tilt machine back into position shown in figure 131, and pull on lever connecting rod (4) to bring shuttle drive lever down through bottom of column.

*b. Disassembly.* Refer to figure 133, and proceed as follows:

(1) Remove needle plate screw (1) and needle plate (2) from shuttle drive gearbox (9).

(2) Lift shuttle assembly (4) with bobbin

(3) from gearbox, and remove bobbin from shuttle.

(3) Remove 2 shuttle pinion cover screws (26) and shuttle pinion cover plate (25).

(4) Remove needle plate locating plunger spring (21) and plunger (20) from hole in bottom of gearbox.

(5) Remove shuttle drive short rack (24) by grasping each end of rack with screwdrivers and lifting rack out of gearbox.

(6) Remove shuttle carrier drive pinion screw (28) from drive pinion (27), and remove drive pinion from end of shuttle carrier (5).

(7) Push shuttle carrier out through top of gearbox.

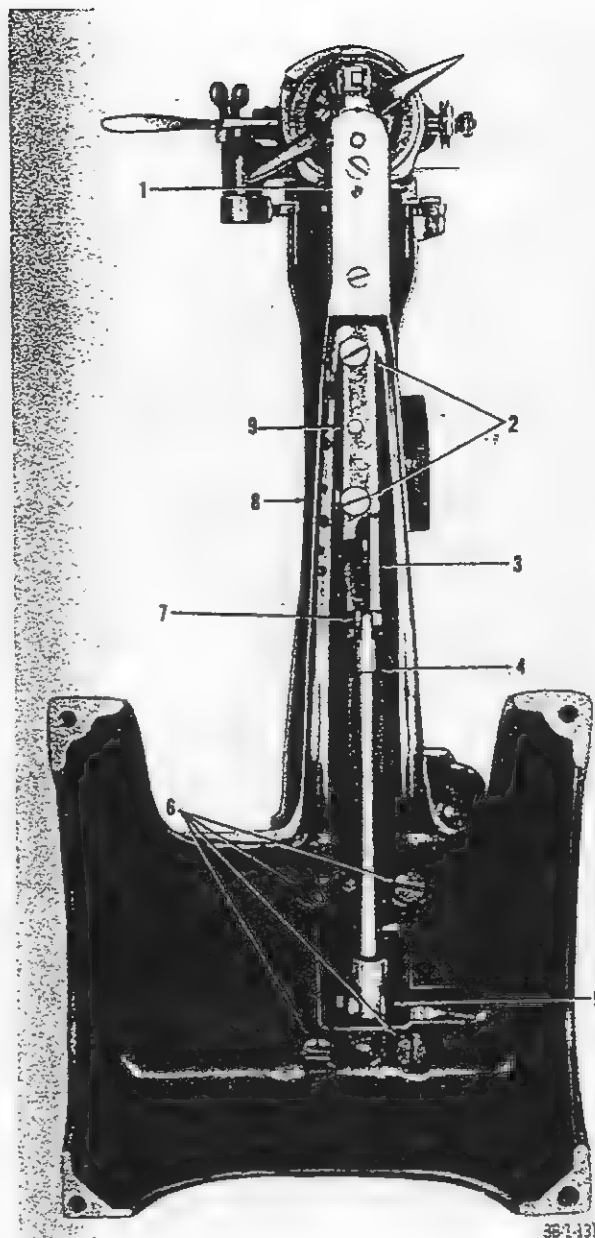
(8) Tap shuttle carrier drive pinion bushing (22) from gearbox.

(9) Tap tapered shuttle carrier following pinion stud (6) out through top of gearbox, and remove following pinion (23) from gearbox.

- (10) Remove shuttle drive long rack (16) from gearbox.
- (11) Tap needle plate releasing lever hinge pin (7) out of side of gearbox, and remove needle plate releasing lever (8) from gearbox.
- (12) Remove shuttle drive lever eccentric stud nut (13), and pull stud (10) from connecting rod (14) and shuttle drive lever (11).

*c. Reassembly.*

- (1) Place shuttle drive lever eccentric stud (10, fig. 133) through holes in connecting rod (14) and shuttle drive lever (11), and install stud nut (13) on stud.
- (2) Connect needle plate releasing lever (8) to shuttle drive gearbox (9) with hinge pin (7).
- (3) Tap shuttle carrier drive pinion bushing (22) into opening in gearbox.
- (4) Tap small end of tapered shuttle carrier following pinion stud (6) into hole on top of gearbox until large end of stud is flush with top of gearbox.
- (5) Fit shuttle carrier (5) through opening of bushing in gearbox, and install on end of carrier the drive pinion (8, fig. 134) with teeth in position shown.
- (6) Install shuttle carrier drive pinion screw (28, fig. 133) into carrier drive pinion.
- (7) Slip shuttle drive long rack (3, fig. 134) into position in raceway in gearbox with first tooth of rack meshing with shuttle carrier drive pinion.
- (8) Slip shuttle drive short rack (7) into position in raceway so first tooth of rack meshes with carrier pinion.
- (9) Fit shuttle carrier following pinion (6) on end of shuttle carrier following pinion stud.
- (10) Slide needle plate locating plunger (20, fig. 133) and spring (21) into hole in gearbox.
- (11) Place shuttle pinion cover plate (2,



- 1 Shuttle drive gearbox
- 2 Shuttle drive gearbox screws
- 3 Shuttle drive long rack
- 4 Shuttle drive lever connecting rod
- 5 Shuttle drive lever eccentric stud
- 6 Patcher arm-to-base screws
- 7 Shuttle drive lever connecting rod hinge screw
- 8 Patcher bed housing
- 9 Shuttle drive gearbox positioning pin

*Figure. 131. Patcher bed positioned for removal of gearbox and shuttle drive lever (front at right; rear at left).*

fig. 134) on gearbox with round end of cover plate at open end of gearbox, press down on plate to hold it against pressure of needle plate locating plunger spring (5), and install shuttle pinion cover screws (1).

(12) Slide bobbin (3, fig. 133) into shuttle (4), and fit shuttle in shuttle carrier in gearbox.

(13) Place needle plate (2) on top of gearbox, and install needle plate screw (1).

*d. Installation.* Reverse procedure in *a* above.

## 192. Patcher Arm

### *a. Disassembly.*

(1) Remove patcher head (par. 190a).

(2) Disassemble patcher arm (fig. 135) as it is removed from machine.

(3) Remove drive belt (fig. 135) by working belt off drive pulley.

(4) Remove balance wheel handle spindle nut (31, fig. 136), spindle (29), and handle (30) from balance wheel (25).

(5) Remove balance wheel stop motion plunger thumb nut (28) from plunger (23).

(6) Remove balance wheel retaining screw

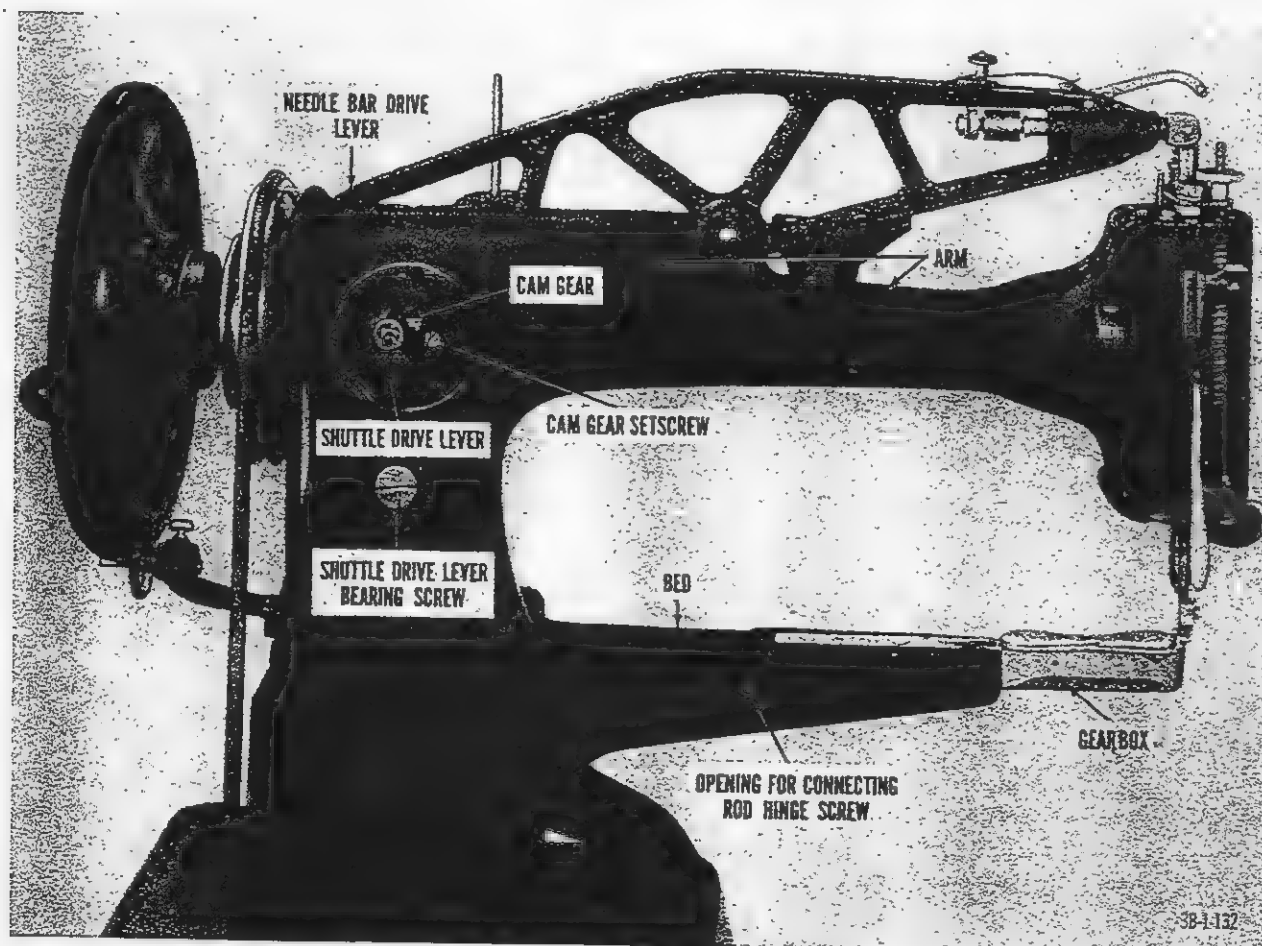
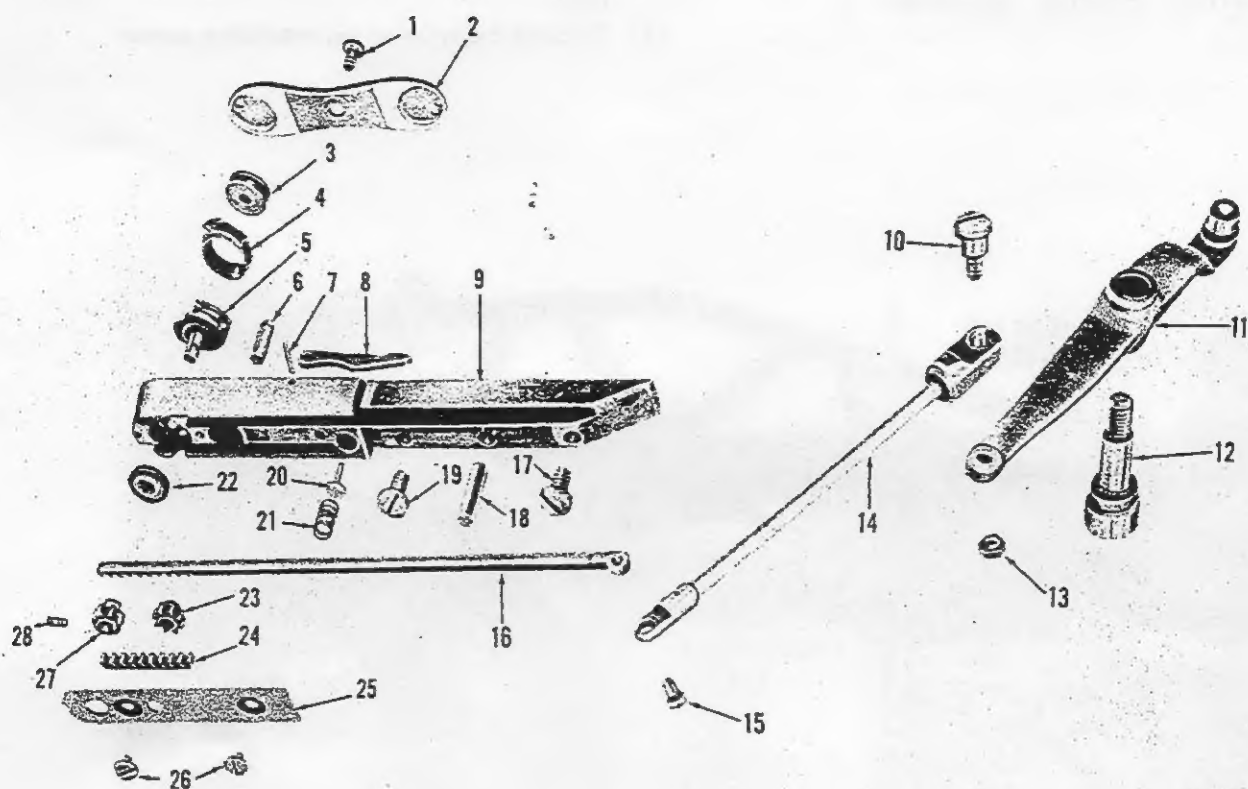


Figure 132. Patcher bed and arm, rear view, with shuttle drive lever and cam exposed.

- (27) from stop motion flanged bushing (22).
- (7) Remove balance wheel from stop motion flanged bushing with plunger spring (24) and plunger.
- (8) Remove balance wheel stop motion plunger stop screw (26) from balance wheel, and remove stop motion plunger and spring from wheel.
- (9) Unscrew balance wheel stop motion flanged bushing binding screws (32)

from flanged bushing, and slide bushing from drive shaft (34).

- (10) Remove drive pulley pin (21) from drive pulley (20), drop belt off end of drive shaft, and slide pulley from shaft.
- (11) Remove needle bar drive lever pin (35) from needle bar drive lever (36), and remove drive lever from arm.
- (12) Remove check lever indicator ad-



38-1-133

- |   |   |
|---|---|
| 1 Needle plate screw                      | 15 Shuttle drive lever connecting rod hinge screw |
| 2 Needle plate                            | 16 Shuttle drive long rack                        |
| 3 Bobbin                                  | 17 Shuttle drive gearcase screw                   |
| 4 Shuttle assembly                        | 18 Shuttle drive gearbox positioning pin          |
| 5 Shuttle carrier                         | 19 Shuttle drive gearcase screw                   |
| 6 Shuttle carrier following pinion stud   | 20 Needle plate locating plunger                  |
| 7 Needle plate releasing lever hinge pin  | 21 Needle plate locating plunger spring           |
| 8 Needle plate releasing lever            | 22 Shuttle carrier drive pinion bushing           |
| 9 Shuttle drive gearbox                   | 23 Shuttle carrier following pinion               |
| 10 Shuttle drive lever eccentric stud     | 24 Shuttle drive short rack                       |
| 11 Shuttle drive lever                    | 25 Shuttle pinion cover plate                     |
| 12 Shuttle drive lever bearing screw      | 26 Shuttle pinion cover screws                    |
| 13 Shuttle drive lever eccentric stud nut | 27 Shuttle carrier drive pinion                   |
| 14 Shuttle drive lever connecting rod     | 28 Shuttle carrier drive pinion screw             |

Figure 133. Patcher bed assembly, exploded view.



justing screw locknut (17) from adjusting screw (16), and remove adjusting screw from indicator head (12).

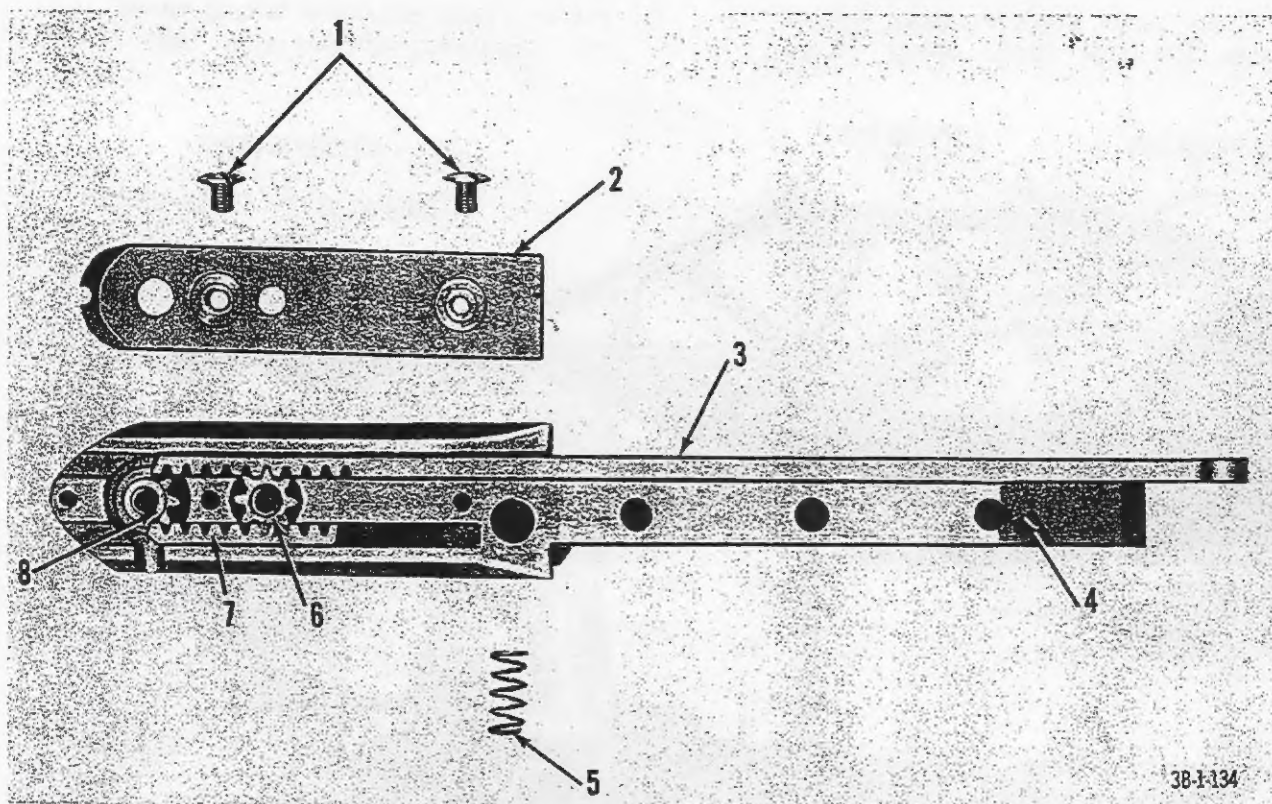
(13) Remove check lever indicator (15) from adjusting screw.

(14) Remove check lever indicator locating plunger (14) and spring (13) from indicator head.

tension spring stud nut (8) from stud (9), and unscrew stud to release tension spring (7).

(18) Remove vibrating presser lifting lever screw (25, fig. 130) from heavy work lifting lever (26), and remove lever.

(19) Remove rear side cover thumbscrew (39, fig. 136) and rear side cover (40).



- |                               |  |
|-------------------------------|--|
| 1 Shuttle pinion cover screws | 5 Needle plate locating plunger spring |
| 2 Shuttle pinion cover plate  | 6 Shuttle carrier following pinion     |
| 3 Shuttle drive long rack     | 7 Shuttle drive short rack             |
| 4 Shuttle drive gearbox       | 8 Shuttle carrier drive pinion         |

Figure 134. Shuttle drive gearbox assembled.

(15) Remove check lever indicator head and hexagon nut (11) from needle bar piston joint (4), and remove nut from head.

(16) Remove thread takeup check lever hinge pin (6), check lever (5), and needle bar piston joint from needle bar drive lever.

(17) Remove thread takeup check lever

(20) Remove shuttle drive lever bearing screw (fig. 132). Turn drive shaft enough to release shuttle drive lever from shuttle drive lever cam. If necessary, tip machine on end (fig. 131) enough to pull connecting rod (4) and make sure lever is free of cam.

(21) Hold feed motion cam wheel (1, fig.



136), turn drive shaft until lever cam setscrew (18) shows in opening, and remove screw.

(22) Turn drive shaft again until shuttle drive cam pin (19) shows in arm opening for needle bar drive lever (fig. 132). Drive pin from arm so pin drops from base.

(23) Remove feed motion cam wheel pin (2, fig. 136) from cam wheel, and slide cam wheel and drive shaft bushing (37) from drive shaft.

(24) Grasp drive shaft at head end of arm and pull shaft slowly. Keep

other hand on shuttle drive cam with gear (33) until it slides off balance wheel end of shaft in housing. Remove cam with gear through rear side opening.

*b. Reassembly.* Reverse procedure in *a* above.

*c. Adjustment.*

(1) Thread machine (par. 175d).

(2) Adjust thread takeup check lever tension and stroke (par. 173).

(3) Adjust range of thread takeup check lever regulator indicator (par. 187).

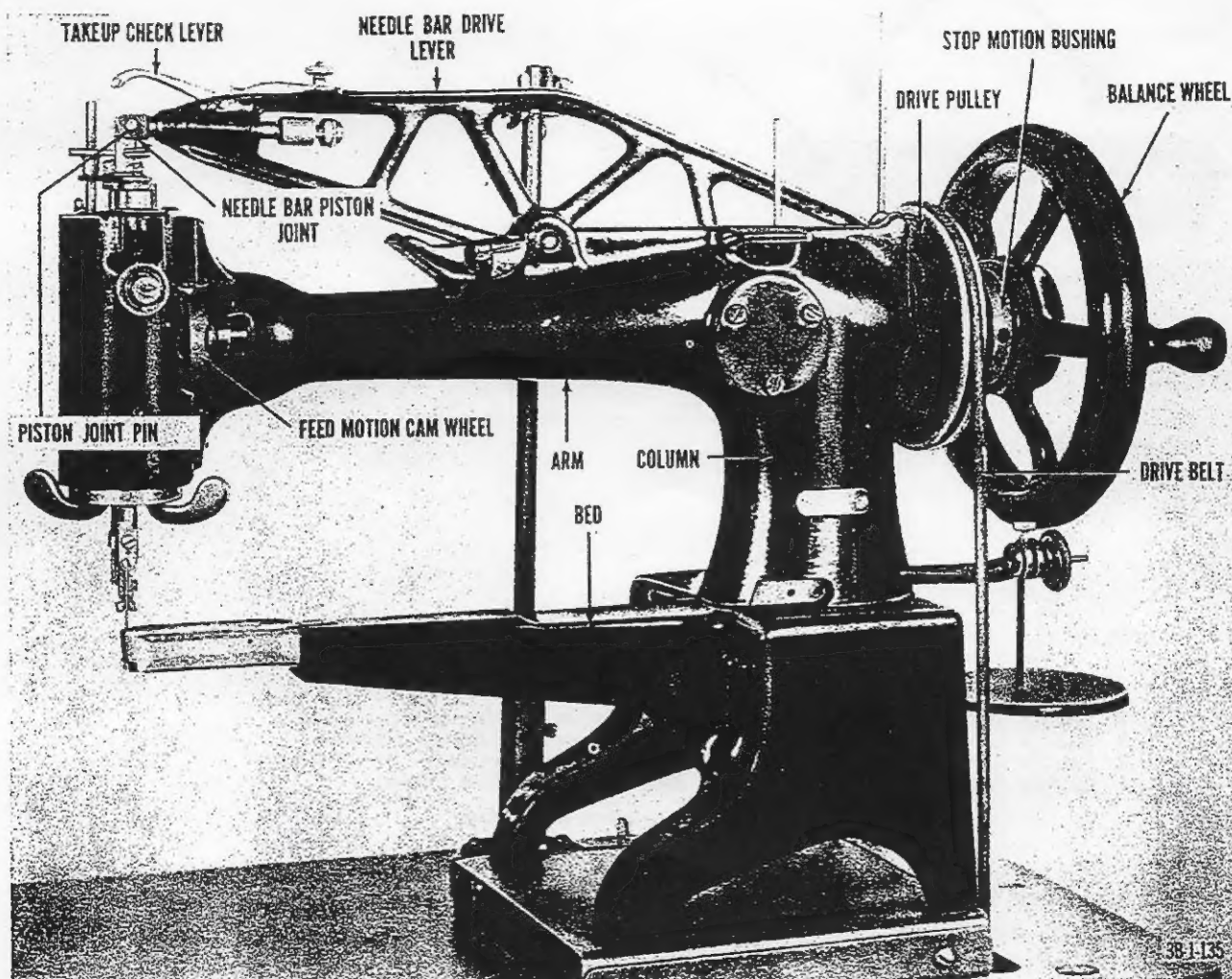
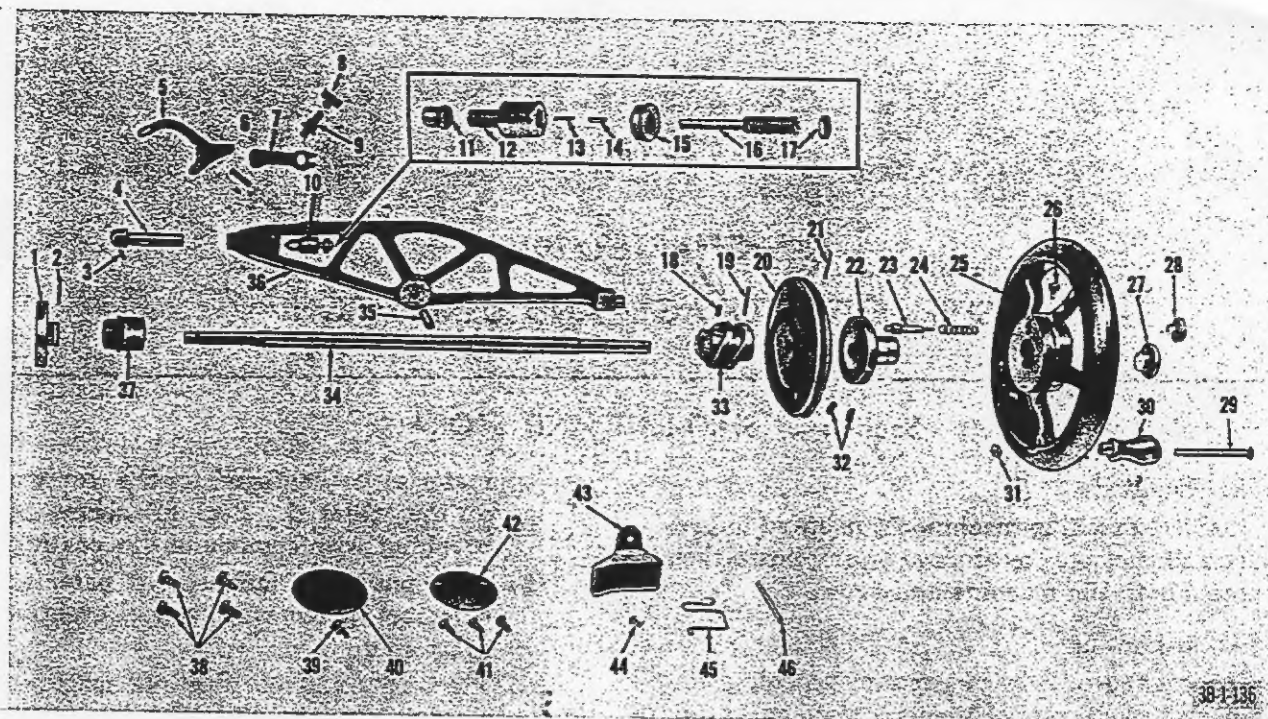


Figure 135. Patcher arm, front view.





- |    |   |    |  |
|----|---|----|--|
| 1  | Feed motion cam wheel                             | 25 | Balance wheel  |
| 2  | Feed motion cam wheel pin                         | 26 | Balance wheel stop motion plunger stop screw             |
| 3  | Needle bar piston joint pin                       | 27 | Balance wheel retaining screw                            |
| 4  | Needle bar piston joint                           | 28 | Balance wheel stop motion plunger thumb nut              |
| 5  | Thread takeup check lever                         | 29 | Balance wheel handle spindle                             |
| 6  | Thread takeup check lever hinge pin               | 30 | Balance wheel handle                                     |
| 7  | Thread takeup check lever tension spring          | 31 | Balance wheel handle spindle nut                         |
| 8  | Thread takeup check lever tension spring stud nut | 32 | Balance wheel stop motion flanged bushing binding screws |
| 9  | Thread takeup check lever tension spring stud     | 33 | Shuttle drive cam with gear                              |
| 10 | Thread takeup check lever indicator and regulator | 34 | Drive shaft  |
| 11 | Check lever indicator head hexagon nut            | 35 | Needle bar drive lever pin                               |
| 12 | Check lever indicator head                        | 36 | Needle bar drive lever                                   |
| 13 | Check lever indicator locating plunger spring     | 37 | Drive shaft bushing                                      |
| 14 | Check lever indicator locating plunger            | 38 | Patcher arm-to-base screws                               |
| 15 | Check lever indicator                             | 39 | Rear side cover thumbscrew                               |
| 16 | Check lever indicator adjusting screw             | 40 | Rear side cover  |
| 17 | Check lever indicator adjusting screw locknut     | 41 | Front side cover screws                                  |
| 18 | Shuttle drive cam setscrew                        | 42 | Front side cover   |
| 19 | Shuttle drive cam pin                             | 43 | Drive lever oilcup                                       |
| 20 | Drive pulley                                      | 44 | Drive lever oilcup screw                                 |
| 21 | Drive pulley pin                                  | 45 | Drive lever oilcup spring                                |
| 22 | Balance wheel stop motion flanged bushing         | 46 | Thread spool pin   |
| 23 | Balance wheel stop motion plunger                 |    |  |
| 24 | Balance wheel stop motion plunger spring          |    |  |

Figure 136. Patcher arm, exploded view.